



Fall 2017

# Environmental Impact Assessment: Georgia-Pacific Wharf Renovation, Bellingham, WA

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# Georgia-Pacific Wharf

Environmental Impact Assessment

Joshua Grandbouche, Kevin Webber, Alex Liebman,  
Skye French, and Parker Giebelhaus

Fall 2017  
Western Washington  
University



ENVS 493  
Huxley College of  
the Environment

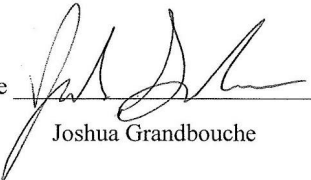
**Environmental Impact Assessment**  
Huxley College of the Environment


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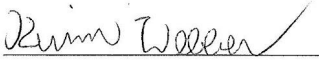
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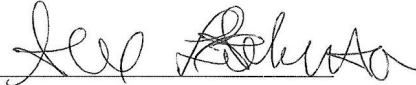
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Parker Giebelhaus

Date November 15<sup>th</sup>, 2017

Dear Concerned Citizen,

The following document lays out the relevant potential environmental impacts of the project proposal for the Georgia-Pacific (GP) Wharf. The associated Environmental Impact Assessment (EIA) – this document – was prepared for the capstone Environmental Studies course 493 under the supervision of Professor Tammi Laninga. This EIA is in compliance with the State Environmental Policy Act (SEPA, WAC 197-11).

The GP Wharf is located along the Whatcom Waterway on the waterfront of downtown Bellingham, Washington. In use as commercial moorage for the better part of the twentieth century, the current owners – The Port of Bellingham (POB) – in conjunction with the City of Bellingham (COB) have proposed opening the wharf to the public as a “seawalk,” similar to the Taylor Dock at Boulevard Park south of the wharf. This EIA looks at the project proposal as well as a few alternative actions for the wharf: shoreline improvement and the “no action” alternative.

The goals of this EIA are to determine impacts of the project proposal and alternatives on the natural and built environment and to develop mitigation measures for those impacts. The scope of the EIA will be limited to the wharf and immediate relevant surrounding areas. Comments and constructive criticisms are welcome and encouraged. Thank you for your interest in the development of Bellingham’s waterfront and this EIA for the GP Wharf.

Sincerely,

Joshua Grandbouche, Kevin Webber, Skye French, Alex Liebman, and Parker Giebelhaus  
*Georgia-Pacific Wharf Environmental Impact Assessment Team*  
*Western Washington University*



# **Environmental Impact Assessment: Georgia-Pacific Wharf Renovation**

**Bellingham, WA**

**Prepared for:**

Professor Tammi Laninga  
ENVS 493  
Western Washington University  
Fall 2017

Huxley College of the Environment

**Prepared by:**

Skye French  
Parker Giebelhaus  
Joshua Grandbouche  
Alex Liebman  
Kevin Webber

## **DISCLAIMER**

This report represents a class project that was carried out by students of Western Washington University, Huxley College of the Environment. It has not been undertaken at the request of any persons representing local governments or private individuals, nor does it necessarily represent the opinion or position of individuals from government or the private sector.

## Fact Sheet

**Proposed Action and Alternatives:** The Port's proposal is to remove the existing wharf and replace it with a "seawalk" focused on community engagement, interaction with nature, visitor moorage, and local history. The seawalk will be an extension from the upcoming Waypoint Park and part of the larger Waterfront District subarea plan developed by the Port and City of Bellingham (2013). After replacing the insecure pilings and outdated wharf material, the new wharf would be available for recreational use, natural history interpretive education, shoreline habitat improvement, and community engagement such as art and First Nations' collaboration. The estimated dimensions of the current wharf are 16 feet wide by 1,330 feet in length, leaving ample room for pedestrian access, tables and benches, and group events.

**Project Location:** 300 West Laurel Street, City of Bellingham Georgia-Pacific West Site, East of Central Waterfront Site (which contains ASB), Southwest of Downtown District and Maritime Heritage Park, West of Cornwall Street. Facility Site ID: #14

**Project Proponent:** Port of Bellingham

Brian D. Gouran, Port of Bellingham, 360-676-2500, P.O. Box 1677 Bellingham, WA 98227-1677

**Lead Agency:** City of Bellingham

### List of Permits and Approvals

For the specific courses of action covered in this report, some or all of the following permits and approval processes will be required:

#### *Local*

- City of Bellingham (COB) Shoreline Substantial Development Permit (BMC Title 22.05)
- COB Fill and Grade Permit (BMC Title 16.70)
- COB Construction Stormwater Permit (BMC Title 15.42)
- COB Critical Areas Ordinance (BMC Title 16.55.420)

#### *State*

- Department of Ecology (DOE) National Pollutant Discharge Elimination System (NPDES) Construction General Permit
- DOE NPDES Waste Discharge Permit
- Department of Natural Resources Aquatic Use Authorization
- Department of Ecology Coastal Zone Management Certification

#### *Federal*

- U.S. Army Corps of Engineers Section 404 Permit under the Clean Water Act
- U.S. Fish and Wildlife Service Incidental Take Permit under the Endangered Species Act

### Authors and Principal Contributors:

Joshua Grandbouche: Dear Concerned Citizens, Cover Page, Title Page, Outlining, Editing, Energy and Natural Resources, Light and Glare, Transportation, Utilities

Kevin Webber: Fact Sheet, Permits, Water, Air

Alex Liebman: Impact Matrix, Earth, Plants, Recreation, Liaison to Outside Entities

Skye French: List of Figures and Tables, Glossary, Acronyms, Animals, Land and Shoreline Use, Historic and Cultural Preservation

Parker Giebelhaus: Executive Summary, Environmental Health

**Acknowledgements:**

Brian D. Gouran, Director of Environmental Programs, Port of Bellingham, P.O Box 1677  
Bellingham, WA 98227

**Distribution List:**

Port of Bellingham

Western Washington University

**Final EIS Issue Date:** December 13, 2017

**Approximate Date of Final Action:** March, 2018

**Type and Timing of Subsequent Review:** Public Meeting will take place on EIS Issue Date.

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## Glossary

- **Aeration Stabilization Basin:** industrial wastewater treatment area built by Georgia-Pacific in the 1970s to remove contaminants – mainly dioxins and mercury – before release into Bellingham Bay. The area employs bacteria in a similar fashion as sewage treatment to oxidize and partition contaminants for removal and transportation to a landfill. Currently, the ASB treats stormwater from the uphill residential area, the Central Waterfront, and the GP site, and is below capacity.
- **Bioaccumulation:** the process of a chemical concentration increasing in organisms above concentrations in food, water, and environment. Exposure to a chemical concentration over time leads to increasing concentrations within exposed organisms.
- **Bioavailability:** “the degree and rate at which a substance (such as a drug) is absorbed into a living system or is made available at the site of physiological activity” (Merriam-Webster Dictionary, 2017).
- **Creosote:** a dark brown oil distilled from coal tar and used as a wood preservative. It contains a number of phenols, cresols, polycyclic aromatic hydrocarbons and other organic compounds. These compounds are known by the EPA to be carcinogenic.
- **Dioxins and furans:** Chlorinated organic chemicals that are the most carcinogenic toxicants known to humans, with a high resistance to environmental degradation and an ability to accumulate in fatty tissues and magnify up food chains; they are a byproduct of paper manufacturing. Dioxin-contaminated soil is strictly regulated under the Model Toxics Control Act, so after the Whatcom Waterway Cleanup, the Department of Ecology required the dredged sediment to be stored nearby on top of the Cornwall Landfill under plastic tarps.
- **Diurnal:** an organism that bases its life-cycle around the day (vs. nocturnal, at night).
- **Environmental CAP:** Cleanup Action Plan, the process of expelling, removing, reducing, and preventing further spread of harmful contaminants into an area, usually using physical substrate such as gravel, soil, woody debris, etc.
- **Haul-outs:** materials used by seals to rest from swimming.
- **Heavy metals:** metallic elements that have a relatively high molecular weight and cause metal toxicity at relatively low concentrations compared to essential nutrients.
- **Hydric Soil:** soil that is saturated by water either permanently or seasonally and shows signs of reducing conditions such as gleyed color, oxidized root channels and partially decomposed organic matter.
- **Liquefaction:** the act of loose sand and silt saturated by water, that can behave like a liquid in the event of a large disturbance like an earthquake.
- **Mitigation:** The process of reducing the severity, scope, or impacts of a proposed action.
- **Moorage:** Docking for small watercrafts, usually sailboats and small cabin cruisers in the context of this project.

- Nitrogen Oxides: one of the Criteria Air Pollutants monitored under the National Ambient Air Quality Standards. An air pollutant emitted from combustion exhaust that can lead to ozone production, which causes respiratory irritation.
- Nocturnal: An organism that bases its life-cycle around the night (vs. diurnal, in daylight).
- Particulate Matter: for this paper, these include particles with a diameter of 2.5 micrometers or less that have become airborne. Common sources include diesel exhaust and fugitive dust from demolition and transportation of construction materials. The EPA has regulations for both 2.5 micrometers or less and 10 micrometers or less.
- Riprap: loose stones or boulders used as a breakwater
- Volatile Organic Compounds: organic compounds containing carbon that have high vapor around room temperature, meaning they easily change to gaseous form. Some are carcinogenic; most are hazardous to human health in various ways such as eye, throat, and lung irritants.
- Waterfront District Subarea Plan: Coordinated plan between the City and Port of Bellingham to develop the 237 acre “waterfront district” property (the former GP Mill site) into a “thriving mixed-use urban neighborhood” with commercial and city park properties. (City of Bellingham & Port of Bellingham, 2013).

## *Abbreviations and Acronyms*

- ASB: Aeration Stabilization Basin
- BMP: Best Management Practices
- CAP: Cleanup Action Plan
- COB: City of Bellingham
- CWA: Clean Water Act
- DOE: Department of Ecology
- EIA/EIS: Environmental Impact Assessment/Statement
- ESA: Endangered Species Act
- EPA: Environmental Protection Agency
- ESU: Evolutionary Significant Unit
- GHG: Greenhouse gases
- GP: Georgia-Pacific
- LED: Light Emitting Diode
- MH: Metal Halide Lamps
- MTCA: Model Toxics Control Act
- MLLW: Mean Lower Low Water
- NOAA: National Oceanic and Atmospheric Administration
- NWCAA: Northwest Clean Air Agency
- PAH: Polycyclic Aromatic Hydrocarbon
- POB: Port of Bellingham
- PSE: Puget Sound Energy
- PTRAU: Pulp/Tissue Mill Remedial Action Unit
- SEPA: State Environmental Protection Act
- VOC: Volatile Organic Compounds
- WWU: Western Washington University
- WSDOE: Washington State Department of Ecology
- WSDFW: Washington State Department of Fish and Wildlife

# 1.0 Executive Summary

## Purpose

The purpose of this Environmental Impact Assessment is to analyze the significant environmental impacts that would be associated with transforming the Georgia-Pacific Wharf into a community attraction. This document evaluates impacts on both the natural and the built environment of the waterfront of the project proposal and the identified alternatives.

## Proposed Action

The Port of Bellingham has proposed replacing the existing wharf and transforming it into a seawalk that focuses on community engagement, interaction with nature, visitor moorage, and local history. The Port plans to replace the insecure pilings and outdated wharf materials used with new, stronger material that will provide for a safer and realistic look. The Port of Bellingham plans on having the seawalk be available for recreation use, natural history interpretive education, shoreline habitat improvement, and community engagement such as art and First Nations collaboration. The dimensions of the wharf are roughly 16 feet wide by 1,330 feet in length, offering plenty of room for pedestrian access as well as areas to catch up with friends such as benches and tables along the walkway.

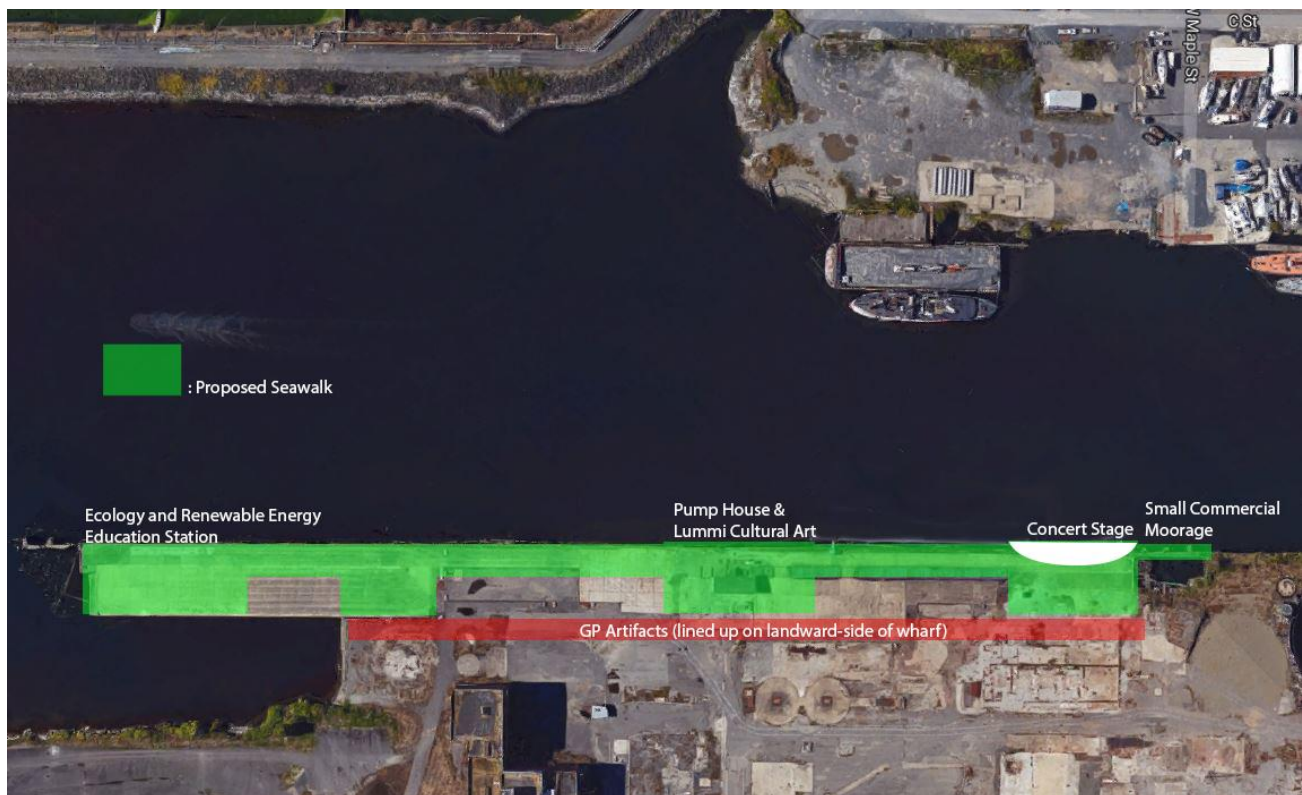


Figure 1: Proposed Seawalk (green) and historical artifacts location (red) (Source: Google Maps)

## Alternatives

1. **Shoreline Improvement:** The wharf would be removed and the area would be replaced with a less accessible shoreline as a continuation of the new Waypoint Park. This alternative includes the full removal of the wharf and riprap to be added along the Whatcom Waterway. There will also be native vegetation planted amongst the riprap to promote native species.

2. No Action - the wharf would remain as is and would not be opened up to the public due to its unsafe nature.

### **Summary of Significant Impacts**

The proposed action, which entails the removal of the wharf on site, shows that there will be significant impacts during construction and operation. The initial action to create a new wharf as a seawalk open to the public and the shoreline improvement alternative both carry significant associated impacts on the natural and built environments, especially those associated with the complete removal of the wharf and bulkhead. After analysis, though, the most problematic action would be to leave the wharf as is and not do any removal or replacement. This “no action” alternative is noted in our decision matrix (section 1.1) to create negative impacts in almost every environmental dimension considered by this report, due to the toxic nature of the wharf’s materials and its inevitable collapse into the Whatcom Waterway. Although the construction of the seawalk has associated health implications, these are only applicable during construction of the new and improved wharf. The proposed plan also indicates large improvements in both shoreline use as well as recreation for the citizens of and visitor to Bellingham.

One of the largest impacts of the proposed action is the estimated increase in downtown traffic from people wanting to come enjoy a part of the waterfront that has not been open to the public in over a century. Since there will be implications regarding the environmental health in the region, care will be taken to keep workers safe and not become at risk of inhaling toxins and carcinogens that are currently present in the groundwater and soil in and around the GP Wharf. With regards to our alternative of an improved shoreline, there will still be some implications with environmental health – at least temporarily to the people working on or near the wharf location. The shoreline improvement alternative, as per our decision matrix (section 1.1), is still an improvement over the no action alternative. Although there will not be as much access to the waterfront for recreation under shoreline improvement, there will still be a trail, connected to Waypoint Park, so those interested can at least walk along the improved shoreline. With the plan of adding a riprap revetment after the removal of the wharf, this should offer increased protection from possible erosion occurring near the contaminated soil beneath the proposed walkway due to intense wave action along this section of the Whatcom waterway.

Since both the proposed action as well as the alternative provide overall improvements in the land, the no action alternative is clearly the most detrimental alternative, not only to the citizens of Bellingham, but also to the surrounding ecosystems due to the high possibility of toxins leaching into the Whatcom Waterway. This report offers a complete look at each action that has been offered on what to do at the GP Wharf site, as well as the implications that can occur if certain matters are not taken care of and possible mitigation measures to address impacts.

## 1.1 Impact Matrix

	Seawalk	Natural Shoreline	No Action
Earth	+1	+1	-1
Air	0	-1	0
Water	+1	-1	-1
Plants	+1	+1	0
Animals	+1	+1	0
Energy and Natural Resources	+1	+1	0
Environmental Health	+1	+1	-1
Environmental Health*	-1*	-1*	0*
Land and Shoreline Use	+1	+1	-1
Historical and Cultural Preservation	+1	+1	0
Recreation	+1	+1	0
Transportation	-1	-1	0
Utilities	0	0	-1
Light and Glare	-1	-1	0
Totals	6	3	-5

### Matrix Key

Positive impact +1

No impact 0

Negative impact -1

Temporary Impact \*



## 2.0 Introduction and Project Overview

Bellingham's waterfront has a long history of industry. Early on, the Whatcom Waterway was built to facilitate industry and shipping in the burgeoning town ("Port Timeline"). This reshaped the coastline, creating large new areas of fill that industry was built on. The Puget Sound Pulp and Timber Co. was the main employer there, established in 1925 and lasting until 1963, when Georgia-Pacific (GP) purchased the plant. GP is an Atlanta-based company, and is one of the leading distributors of pulp, paper, packaging and building products in the US. When the plant was at its peak under GP, it employed 1,200 people; had an ethanol distillery, pulp mill, chlorine plant, and research lab; and ran a very active shipping wharf for their products. These processes produced a significant level of pollution in the groundwater, soil, and sediments. When GP sold the land - including the wharf - to the Port of Bellingham in 2005, the legacy of pollution was passed to the Port. Thus, cleanup efforts have coincided with attempts to develop the GP land into commercial and residential use for the city.

Two different areas have been designated for cleanup on the GP west site, the Pulp/Tissue Mill Remedial Action Unit and the Chlor-Alkali Remedial Unit (see Figure 2). The GP Wharf is located west of the Pulp/Tissue Mill Remedial Action Unit (PTRAU). As described in the determination of non-significance (DNS) report issued by the Washington State Department of Ecology (DOE) for the cleanup of the PTRAU, there are multiple contaminants exceeding safety standards in the soil and groundwater underneath the GP West site (Port of Bellingham, 2014). These include, but are not limited to, the following:

- Mercury
- Dioxin
- Furan
- Arsenic
- Lead
- Petroleum products

Interim actions in 2011, 2013, and 2017 have led to the removal of much of the contaminated soil/building materials and capping of the remainder with a layer of gravel on the uplands site (Washington State Department of Ecology, 2017). The contaminated groundwater has been determined to be contained and will be monitored continually for any changes.

This cleanup has coincided with a cleanup of the Whatcom Waterway, which the wharf is located directly on. In 2015, the Port led efforts to dredge and remove large amounts of contaminated soils, creosote-treated timbers, other hazardous building materials, and cap the remainder with clean soil. A wall was also installed along the coastline to support the integrity of the uplands area of the GP site and prevent contaminated groundwater from seeping into the Whatcom Waterway (Washington State Department of Ecology, 2016).

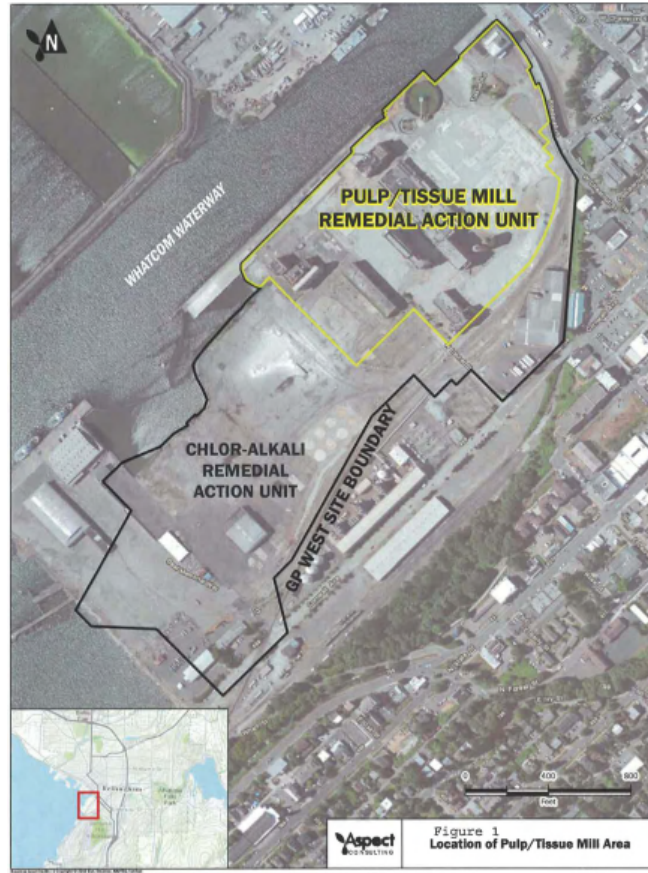


Figure 2: map of GP West site, including wharf along Whatcom Waterway. Grading and bulkhead removal near wharf in Pulp/Tissue Mill Remedial Action Unit may lead to increased leaching of heavy metals, acids, VOCs, PAHs and dioxins into the Whatcom Waterway (north of wharf) (Port of Bellingham, 2014).

The GP Wharf, located along the Whatcom Waterway itself, is the scope of the current project. Out of use since the mill closed in 2007, the wharf has fallen into a dilapidated state. In the last years of its operations, the wharf was given only minimal repair to keep it in operation. Currently, there are many unsafe sections featuring collapsing asphalt, piles that are no longer capable of holding weight, and rusted mooring equipment. The wharf must undergo extensive renovation or removal and replacement before any of it can be publicly available.

### **Proposed Action**

The current proposal, after considering the possible impacts and necessary mitigations, is to convert the wharf into a seawalk. This would be an extension of Waypoint Park, currently under development just north of the wharf on the GP site, near the Granary Building on Roeder Avenue. The seawalk would feature a rejuvenated coastline for wildlife, with an over-water walkway similar to Taylor Dock near Boulevard Park (located in Fairhaven south of the wharf). The walkway would feature a concert stage with lighting supplied by renewable energy, art and other cultural artifacts of nearby indigenous populations such as the Lummi and Nooksack tribes, historical artifacts pulled from the GP buildings upland from the wharf, and educational panels on renewable energy and local wildlife to highlight the confluence of nature and sustainable industry at this historic site. The seawalk would be contiguous with Waypoint Park to the north and the entirety of the Waterfront District Subarea to the

east. The impacts and needed mitigations to realize this proposal are detailed below, sorted into the elements of the natural and built environments.

Two other alternative courses of action and their associated impacts and mitigations are detailed in this report:

- Shoreline Improvement
- No Action

### ***Shoreline Improvement***

The shoreline improvement alternative considers removing the wharf entirely and replacing it with a riprap revetment to protect the uplands from erosion and provide a habitat for marine and terrestrial wildlife. A trail would be built alongside the shoreline to allow for recreation, walking, and jogging. This trail would be contiguous with Waypoint Park to the north of the wharf, as well as any other trails in the larger Waterfront District Subarea.

While changing the wharf to a natural shoreline- i.e., replacing riprap with a softer substrate and gentler gradient - would be the most desirable alternative to the seawalk, for a variety of reasons this is most likely not possible. Much of the shoreline of Puget Sound is armored in similar ways, such as seawalls and levees, and this has created a cumulative impact on the flow of sediments and the habitat of near-shore species. However, the shoreline along the Whatcom Waterway was created through fill, and has no basis in historical ecosystem processes. Thus, any truly “natural” shoreline would not only not be natural in regards to the history of the site, but would not have access to the natural processes of sediment restoration that most shorelines have. Further inland along the Whatcom Waterway, Waypoint Park (currently under construction) will feature a beach with soft substrate and gradient. However, the area of the waterfront where the wharf is located receives extensive wave action - unlike Waypoint Park - and in order to cap the contaminated groundwater from reaching the Bellingham Bay, erosion control measures must be stringent. Thus, a riprap revetment is the most logical alternative to the seawalk.

### ***No Action***

The no action alternative explores the impacts of allowing the wharf to continue to decay. This would involve no removal of damaged or deteriorated wharf, and no replacement of any existing wharf material. Any associated mitigation measures are included in the discussion.

### ***SEPA Dimensions - Elements of the Environment***

Following this introduction are the elements of the environment to be reviewed by this report. This examination is split into two main sections - Elements of the Natural Environment and Elements of the Built Environment - with subheadings for each specific environmental dimension. The dimensions addressed in this report are based off those listed under WAC 197.11.444. Some dimensions have been excluded after consultation with Dr. Tammi Laninga and the team responsible for generating this Environmental Impact Statement (EIS). All elements that have been excluded were considered to be irrelevant to the scope of the project at hand or contained no significant impacts to the environment.

The Elements of the Natural Environment to be assessed are: Earth, Air, Water, Plants, Animals, and Energy/Natural Resources. The Element of the Built Environment to be assessed are: Environmental Health, Land and Shoreline Use, Light and Glare, Recreation, Historic and Cultural Preservation, Transportation, and Utilities. All excluded elements were deemed to be nonsignificant in respect to

environmental impacts and the scope of this report. For example, Public Services and Housing were dropped from consideration due to the lack of impacts involving these dimensions; all necessary services are already provided at adequate levels by the city and this project will not require an expansion of them. Any effects on housing are associated with the larger Waterfront District Subarea Plan and are not attributable to development on the GP Wharf site.

## 3.0 Elements of the Natural Environment

This section discusses the components of the natural environment. The natural environment of the proposal focuses on these dimensions laid out by the SEPA checklist: Earth, Air, Water, Plants, Animals, and Energy/Natural Resources. As per Washington State's Environmental Policy Act, the permits for the area will be taken into consideration, as well as the jurisdictions of the state and federal governments.

### 3.1 Earth

This section discusses the current conditions of the earth including the land, soil, seismic risk, and sea level rise that are present at the GP Wharf site. The impacts that are present in the area for the proposed action, the improved shoreline, and the no action alternative are discussed, along with associated mitigation measures.

#### **Current Conditions**

The future Waterfront District is located next to the Whatcom Creek Waterway in downtown Bellingham, Washington. In the early 1900's the Army Corps of Engineers dredged and deepened the Whatcom Waterway as well as deposited soil to the nearby tide flats to create a new area for industrial use. The deposited fill can be made up of any of the following; sand, silt, clay, gravel, sawdust, construction debris, and in any combination. The deposited soil was also used to increase the grading along the Whatcom Waterway, and in some areas compaction of the fill is present (Port of Bellingham, 2016). The soil is comprised of urban land (Web Soil Survey). The hydric soil classification of the site is designated as partially hydric (City of Bellingham, 2017). Beach deposits can be present at the mouth of Whatcom Creek and along the Whatcom Waterway consisting of loose and fine to medium sand with some shell and wood fragments (Port of Bellingham, 2008). The potential erosion hazard for the GP Wharf site is listed as low but erosion may occur during replacement of the wharf. The deposited sediment and fill of the GP Wharf site has the potential to settle over time.

The GP Wharf site is mostly flat ranging from 10 ft. to 25 ft. above mean lower low water (MLLW) level (Port of Bellingham, 2008). The GP Wharf site is listed under the Model Toxic Control Act (MTCA) due to the presence of harmful toxins including; petroleum hydrocarbons, metals, dioxins, furans, PAHs and volatile organic carbons. The MTCA is put in place to protect local citizens and the environment with a distinct cleanup process and plan. When it is not possible to restore a site to meet toxic standards, a seal is put in place to meet health requirements. The existing wharf site has been capped under the MTCA, with consistent monitoring, to ensure that the chemicals are not being leached further into soils and groundwater (Washington State Department of Ecology, 2016).

#### *Seismic Risk*

The GP Wharf site is located on the Cascadia Subduction Zone, making it susceptible to a potential earthquake (Figure 3). The GP Wharf is indicated as having a very high seismic hazard risk, one of the highest in Whatcom County (City of Bellingham, 2017). The Salish Sea is in an area with high

seismic potential, and high levels of ground shaking are possible. The wharf site was created with deposited fill that may contain any combination of fill materials, making the potential for liquefaction high during a large seismic event (Port of Bellingham, 2008). Liquefaction is likely to occur in the event of an earthquake but can also happen during construction activities such as blasting, which may be used in the replacement of the existing wharf in the project proposal (University of Washington, 2000). In the event of an earthquake the entire wharf could crumble and cause serious damage to the area.

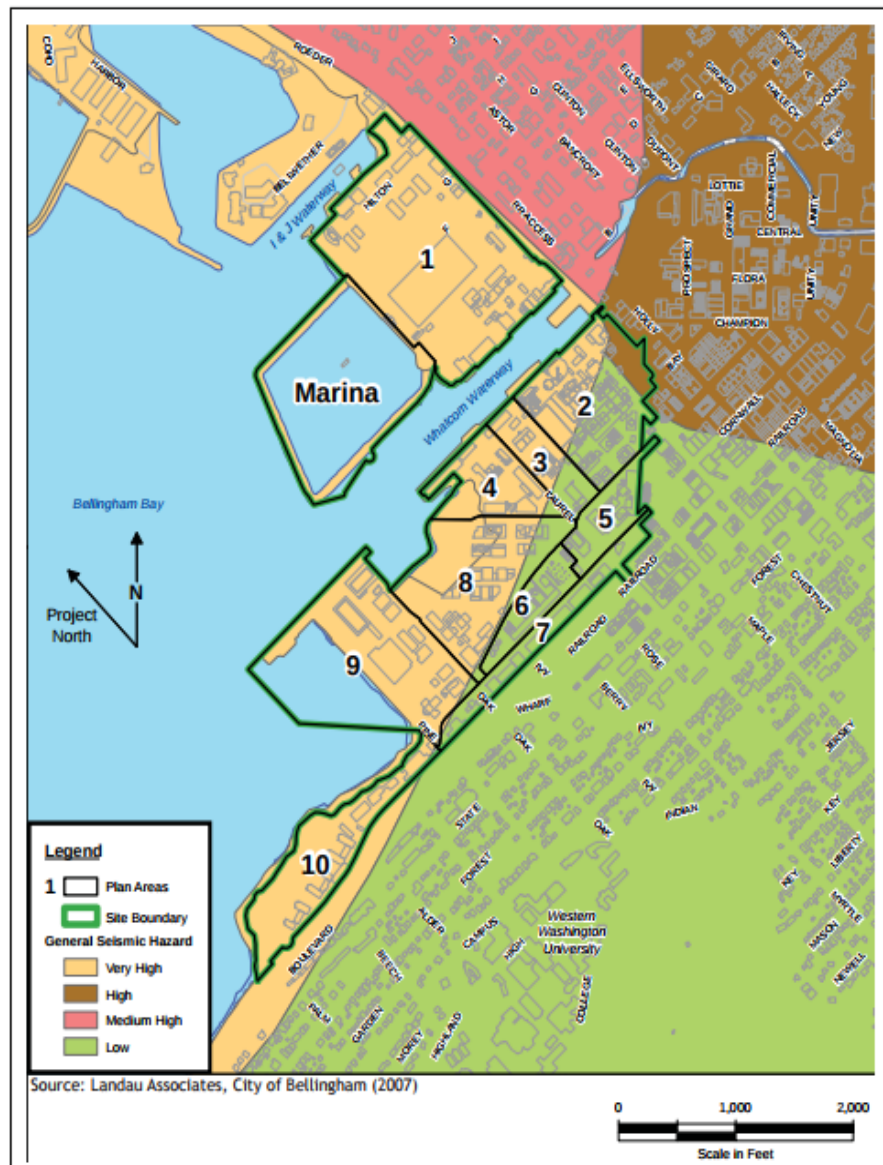


Figure 3. The GP Wharf site is included in areas 2, 3, and 4, and they are all listed with very high general seismic hazard (Port of Bellingham, 2008).

#### Sea Level Rise

As climate change remains a potential impact, sea level rise needs to be taken into consideration, because the GP Wharf is located on and partially over the waterfront. Sea level rise

happens from three main factors: thermal expansion, and melting of ice caps and glaciers. The Department of Ecology projected that sea level can rise about 24 inches or in the range of 4-56 inches in the next century (Table 1). They also predicted that if an earthquake with a magnitude of 8 or higher occurs it is possible for sea level to rise an additional 3-7 feet (Department of Ecology, 2012).

<b>Sea Level Rise Projections Relative to Year 2000 for Washington, Oregon, and northern California</b>		
<b>Year</b>	<b>Projection (in inches)</b>	<b>Range (in inches)</b>
2030	+2.6	-2 to +9
2050	+6.5	-1 to +19
2100	+24	+4 to +56

*Table 1: Department of Ecology Sea Level Rise Projections and ranges for Washington, Oregon and northern California (Department of Ecology, 2012).*

### ***Proposed Action***

### **Impacts**

The following impacts only pertain to the GP Wharf, not the entirety of the Bellingham Waterfront and GP site that includes multiple other impacts. The current conditions of the wharf are not suitable for the proposed action and the wharf will need to be demolished and rebuilt. The construction process to rebuild the existing wharf may include any of the following: demolition, grading, placing and compacting new fill, excavating, and preloading to reduce settlement (Port of Bellingham, 2008).

### *Creosote Pilings*

In the rebuilding process, creosote pilings that have held up the wharf since it was built will be removed. Removing the pilings has the potential to leach some of the creosote into the soil and into the water. The wharf and surrounding GP site have been capped with clean soil and gravel to stop the spread of potential harmful chemicals. In the rebuilding process it is possible for the capped soil to be removed causing chemicals to be re exposed and cause harmful impacts to the site (Washington State Department of Ecology, 2016). The potential for groundwater to arise is possible during the wetter months and construction dewatering may be necessary to control groundwater flow.

### *Seismic Risk*

Due to the high seismic risk at the wharf site it is possible for an earthquake to cause extreme damage to the site that would need to be addressed with the latest engineering and building code seismic standards. Ground-shaking is possible and the rebuild design should take into consideration site-

specific seismic analyses to reduce impacts from earthquakes. Liquefaction is also possible in the event of an earthquake with the fill soil which can cause, slope failure, lateral spreading, and post-earthquake settlement (Port of Bellingham, 2008). Lateral spreading can lead to a break in the upper soil layer that move downslope during a disturbance. Lateral spreading is more susceptible in areas along the water if there aren't adequate seawalls or structures to protect the fill site. Settlement can happen in areas that contain loose and soft-compressible deposits. Settlement can cause damage to existing and future structures; deep foundation systems can reduce the amount of settlement that occurs.

#### *Structural Fill*

During construction of the new wharf the soil that is removed may be deposited and reused as fill in the event that it is handled properly. The grading of the site will need to increase to reduce sea level rise risk, and the excavated soil can be used.

#### *Erosion*

Erosion potential at the site is considered to be low but the potential for erosion may arise when construction takes place due to soil disruption (Port of Bellingham, 2008). Onsite transport of sediment will occur, which can cause erosion impacts from exposed soil and soil stockpiles (Port of Bellingham, 2008).

#### *Sea Level Rise*

Sea level is projected to rise roughly 24 inches by the year 2100, which has the potential to flood the wharf site. A local increase in sea level by about 2 feet will put parts of the existing wharf underwater. Grading will need to increase during the rebuild to ensure the wharf is high enough for future sea level rise projections.

### **Mitigation**

#### *Creosote Piling Removal*

Removal of the creosote pilings and replacing them in the exact same spot will minimize transfer of harmful chemicals and creosote leaching. Washington State Best Management Practices (BMPs) can be used when removing the pilings to reduce impacts. The following apply to piling removal of all types: the condition of the pilings need to be assessed, removal of the wood should happen during low water conditions in dry seasons, piling should be removed slowly to reduce turbidity in the water, minimize damage to treated wood, after removal the piling should be moved to a containment area and disposal site, the piling should not be disturbed and sediment must be returned to the water. Finally, this report recommends that in the event that the piling is difficult to remove, several attempts to remove it should be made before resorting to cutting it (Environmental Protection Agency, 2016).

#### *Erosion*

Erosion control methods and BMPs can be put into place to reduce future erosion at the site. Erosion control can consist of scheduling construction in dry seasons, reducing exposure areas, routing water with temporary drainage systems, seeding/planting vegetation where earth construction is



completed, covering exposed soil with plastic sheeting if necessary, and utilizing straw mulch and matting to stabilize grading areas. Deep foundation and ground improvement could reduce the liquefaction potential (Port of Bellingham, 2008).

#### *Chemical Capping*

In the event the harmful chemicals under the wharf in the soil and groundwater are uncovered, they will need to be recapped. The Port of Bellingham plans to remove the remain 600 cubic meters of mercury soil that is present at the current GP site Cell Building, and a similar plan can be applied in the event that new contamination arises with construction. In 2013 capping efforts, the mercury contamination was covered in elemental sulfur and Portland cement (Germiat, Heffner, 2016).

#### *Seismic Risk*

This report recommends creating a risk aversion plan, considering the high seismic risk present on the GP Wharf site, to ensure that the replacement wharf is equipped to handle an earthquake. This could include deep foundation and driven piles to add support at the site during ground shaking (Port of Bellingham, 2008).

#### *Sea Level Rise*

The grading of the wharf will need to increase to reduce the impact of sea level rise in the future (Port of Bellingham, 2012).

### ***Alternative: Shoreline Stabilization***

#### **Impacts**

Riprap is often used as a method to stop erosion from happening on banks, but it impedes the natural processes of the bank and the riparian zone that creates a natural buffer from the water (Department of Ecology, 2014).

#### *Creosote Pilings*

The wharf is being held up by creosote soaked pilings that will need to be removed for the shoreline improvement alternative. Creosote may be leached into the soil and the water during the removal process.

#### *Chemical Capping*

During the removal of the wharf mercury and other toxins are possible to come across during the construction process. Groundwater and soils can be contaminated and will need to be recapped prior to the addition of the riprap.

Wave and tidal impacts can influence the shoreline improvement alternative and will need to be taken into consideration. The Whatcom Waterway along the GP Wharf site has a lot of wave action, so soft shoreline stabilization approach is not feasible for this location (Gouran, 2017).

**Mitigation**

BMPs for creosote piling removal are recommended to be put in place. These include, but are not limited to, the following: examining the current pilings, removal of the wood during low water conditions in dry seasons, pilings removed slowly to reduce turbidity in the water, minimize damage to treated wood, moving the piles to a containment area and disposal site, and returning sediment to the water. Finally, in the event that the piling is difficult to remove, several attempts to remove it can be made before resorting to cutting it (Environmental Protection Agency, 2016).

*Chemical Capping*

In the event that mercury and other harmful chemicals are exposed during the removal of the wharf there will need to be a capping system in place. In 2013 capping efforts the mercury contamination was covered in elemental sulfur, and Portland cement (Germit, Heffner, 2016). A similar plan can be used to cap the chemicals before the riprap is installed.

*Sea level Rise*

The grading along the Whatcom Waterway will need to be assessed with the slope in order to keep the shoreline improvement alternative from being completely covered due to sea level rise in the next century (Department of Ecology, 2012).

*Erosion Control*

Use materials that will reduce the amount of erosion and settlement include gravel, cobble, boulders, and concrete.

***Alternative: No Action*****Impacts**

The current wharf will continue to leach creosote into the Whatcom Waterway. Settlement of the fill site is likely to occur, with the potential for the wharf to eventually fall into the water. Sea level rise may eventually flood the site if no action is made.

**Mitigation**

Creosote pilings can be removed to prevent further leaching. No construction of the wharf site would take place under the no action alternative so the chemicals that are currently capped will remain capped. Mitigation for erosion is not necessary because no construction of the current soil will occur and the risk will remain low.

## 3.2 Air

This section describes the current air conditions, impacts to air quality from the proposed action of replacing the GP Wharf with a seawalk, shoreline improvement, and no action alternatives, and mitigations to impacted air quality.

### Current Conditions

Air quality in Bellingham is regulated by the federal government, the state of Washington, and a regional agency. The federal government has set air quality standards for pollutants in the Clean Air Act and the National Ambient Air Quality Standards (EPA, 2016). State air pollutant limits are primarily set by the Washington State Ambient Air Quality Standards (WAC 173-476). The Northwest Clean Air Agency (NWCAA) monitors for criteria pollutants in Bellingham and also collects air quality data from prominent industries (NWCAA, 2017). According to the American Lung Association, the Bellingham Metropolitan Area tied for the highest air quality standards in the country for ozone and particulate matter (2016).

NWCAA maintains an air monitoring station in Bellingham about two miles northeast of the wharf (2412 Yew Street) that measures particulate matter with a diameter of 2.5 micrometers or less; air particulate matter concentration exceeds some of the WA Air Quality Advisory limits once or twice in the winter months of most years, but not for extended periods. In the most recent summer (2017), air particulate matter reached levels “unhealthy for sensitive groups” (>35.4ppb) on several days due to forest fires east of the Cascade Mountain Range and in British Columbia (NWCAA, 2017) (Figure 4). This low concentration of particulate matter is reflected in other nearby monitoring stations in Anacortes and Lynden; these stations also monitor for sulfur dioxide, carbon monoxide and ozone, and these monitoring reports do not show any pollutants exceeding the lowest limits in the past six years. Current air conditions near the project site meet National Ambient Air Quality Standards (EPA, 1997) limits and Washington Air Quality Advisory limits (NWCAA, 2017).

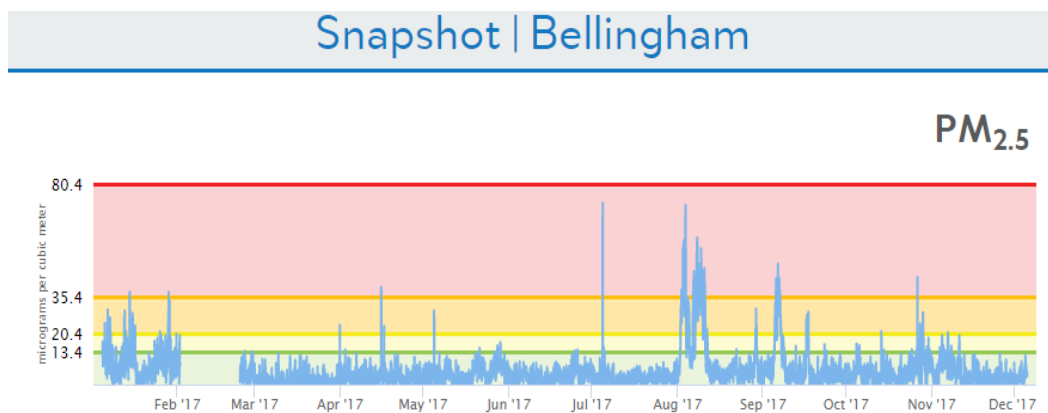


Figure 4. Particulate Matter of 2.5 micrometers or less as measured at 2412 Yew Street, Bellingham, WA, for the past year, excluding late February. Limits are based on WA Air Quality Advisory Limits (NWCAA, 2017) (generated 12/5/2017).

Offsite emissions include gasoline exhaust from boats, diesel exhaust from other sea-going vessels, logging trucks serving the active dock south of the wharf, and the nearby train; exposure to particulate matter, heavy metals, carbon monoxide, ozone or sulfides may lead to negative health

effects for humans and other organisms, but these impacts are minimal since particulate matter monitoring reports are below limits in Bellingham, and monitoring stations in nearby Lynden and Anacortes do not show elevated levels of common air pollutants. Puget Sound Energy owns and operates the Encogen Generating Station east of the wharf, which is fueled by natural gas and emits carbon dioxide and steam.

There are not any significant on-site sources of emissions or odor. City vehicles that drive to the site and the few boats that use a temporary dock at the north end of the wharf may contribute some emissions, but overall the air is currently not being impacted by the wharf's existence. Air pollutants from combustion may be influenced by the offshore breeze, seasonal rain and westerlies.

### **Proposed Action**

### **Impacts**

Air quality impacts will largely be short-term and related to demolition and construction activities. Dust particulates will be a concern when the old wharf is removed. Particulates from asphalt, dirt, wood, and other materials will be in higher concentrations during construction. The asphalt edge may be saw-cut as far back as the mean high tide level, releasing carcinogenic PAHs and silica in asphalt dust (CDC, 2000). Emission from construction equipment will also be present during the demolition and construction phases of asphalt and bulkhead removal, soil excavation for grading, pile replacement and seawalk installment. Heavy machinery and waste material in diesel-powered dump trucks will be transported through downtown Bellingham along Roeder Avenue and Chestnut Street or transported by boat, leading to increased exposure to citizens and tourists of exhaust and particulate matter from both combustion and soil (CIRCA, 2012). Increased concentrations of particulate matter around the roadways due to the proposed action will be minimal because trucks will be covered during transport, and the amount of soil transported after the removal of failing bulkheads and grading will be limited compared to the alternative shoreline improvement impacts. See (FEMA, 2006) for an example of possible particulate matter emissions and diesel and gasoline exhaust (Table 2). The site of the seawalk is exposed to near constant breezes from Bellingham Bay as well as windstorms and seasonal rain, which may expand the area impacted by the air pollution from construction and transportation, but also dilute the pollutants and reduce exposure.

Heavy Duty Trucks Delivery Supply Trucks to Construction Site									
Pollutants	Emission Factors		Assumptions				Results by Pollutant		
	10,000-19,500 lb Delivery Truck	33,000-60,000 lb semi trailer rig	Mile/day	Day/yr	Number of trucks	Number of trucks	Total Emissions Cars tns/yr	Total Emissions Trucks tns/yr	Total tns/yr
VOCs	0.29	0.55	60	240	2	2	0.01	0.02	0.03
CO	1.32	3.21	60	240	2	2	0.04	0.10	0.14
NOx	4.97	12.6	60	240	2	2	0.16	0.40	0.56
PM-10	0.12	0.33	60	240	2	2	0.00	0.01	0.01
PM 2.5	0.13	0.36	60	240	2	2	0.00	0.01	0.02

Table 2. Reported combustion emissions of two truck sizes at a particular construction site as described by FEMA (2006). Truck Emission Factor Source: USEPA 2005.

Increased traffic near the newly created seawalk will also increase concentrations of air pollutants over the long-term. The seawalk is a relatively small park compared to other parks operated by the City of Bellingham, including the neighboring Marine Heritage Park and Waypoint Park, which is under construction. The seawalk will not lead to emissions that differ greatly from current air conditions due to harbor equipment, the active log terminal, boat engines, and downtown traffic off-site. On-site emissions will also be impacted by the wind and rain.

**Mitigation**

Contractors will be prepared to manage dust from asphalt and concrete removal and from exposed dirt piles by wetting and covering with tarps when necessary, including during transportation. Exhaust emissions from construction of the seawalk and demolition of the wharf will be temporary. Mitigation includes following EPA (2007) guidelines for limiting diesel emissions when feasible, including limiting idle times, equipment operator training, and regular maintenance. This may also limit leaks and spills.

In the long term, future development at the waterfront should promote alternative transportation to reduce air pollutant emissions from vehicles. This may include bike paths and bike racks on-site and the promotion of bus routes along the new roads that will service the Waterfront District. Currently, the Whatcom Transport Authority has eight hybrid buses and is considering the implementation of electric engines for buses leading to nearly zero emissions from transportation (WTA, 2017).

***Alternative: Shoreline Improvement*****Impacts**

Air quality impacts in this alternative are sourced from a larger area of asphalt removal and soil grading than the proposed action; this is due to the complete removal of the wharf and pilings, as well as removal of bulkheads and grading to the mean high tide level. Removal of roughly over 20,000 square feet of asphalt and grading of possibly contaminated soil from the wharf to the mean high tide level will lead to greater dust emissions than the proposed action. Dust must be contained and treated in the Aeration Stabilization Basin (ASB) to reduce possible inhalation of airborne PAHs and silica in asphalt dust, PAHs, mercury, VOCs and dioxin in the soil, or exposure to the dusts after they have settled. Excavators will emit diesel exhaust and particulate matter, in addition to the exhaust from construction and maintenance vehicles necessary for wharf removal. This alternative will also lead to increased traffic and subsequent air pollutants nearby, but these will not differ greatly from current conditions or the proposed action.

**Mitigation**

Contractors will be prepared to manage dust from asphalt and concrete removal and from excavation of soil and exposed dirt piles by wetting and covering with tarps when necessary, including during transportation. Asphalt and concrete dust will be removed from the air using spray nozzles and rinse-water collection for treatment in the ASB. Contractors will limit diesel emissions when feasible, including limiting idle times, training operators, and regularly maintaining equipment (EPA, 2007).

***Alternative: No Action*****Impacts**

Emissions from construction equipment on the seawalk and shoreline improvement, removal and grading of bulkheads and soil, and increased traffic would not occur under the No Action alternative. The wharf conditions will continue to degrade, leading to its abandonment as vessel

moorage, which may slightly reduce nearby air emissions, from boat traffic, but the commercial dock and marina nearby will still be in use, so the decrease would be negligible. Structures, asphalt, steel plates, and bulkheads will eventually fall into the Whatcom Waterway, leading to obstructions to boat traffic and sea life, as well as increased exposure to possibly dangerous chemicals and building materials, including VOCs and PAHs present in construction materials and contaminated soil behind bulkheads and riprap.

**Mitigation**

Under the No Action alternative, the lack of maintenance and construction would lead to no emissions from heavy machinery or transportation vehicles. Thus, no mitigation is necessary.

### 3.3 Water

This section describes the water quality of Bellingham Bay, Whatcom Creek, groundwater and surface runoff near the proposed seawalk, impacts to water quality from the proposed action of replacing the GP Wharf with a seawalk and from the shoreline improvement and no action alternatives, and mitigation of impacted water quality.

#### **Current Conditions**

The GP Wharf is built over the Whatcom Waterway, a mixed shoreline use area (COB, 2013) that is adjacent to the Central Waterfront and Bellingham Bay, which drains into the Salish Sea. Whatcom Creek Estuary is directly north of the wharf project; water quality for several criteria parameters is monitored by COB and regulated by the WSDOE. The wharf sits atop pilings set into the Whatcom Waterway seafloor, which was recently dredged and capped (WSDOE, 2015). All surface runoff and stormwater onsite is currently collected at the onsite pumphouse and treated in the Aeration Stabilization Basin (ASB). Groundwater is capped and monitored to ensure that contamination is not worsening (POB, 2014 and WSDOE, 2015). The marine sediment is classified under the Model Toxics Control Act due to the elevated concentrations of dioxins and PAHs, and presence of lead, mercury and PCBs (WSDOE, 2015), but these toxicants are concentrated in the sediment and not the water column.

Whatcom Creek and its tributaries regularly do not meet certain water quality standards set by the WSDOE (COB, 2014), especially for elevated temperatures and fecal coliform bacteria concentrations (Figure 5). However, in the last year of published monitoring results (2014), COB reported that Whatcom Creek met Recreational Use Standards for fecal coliform bacteria and met Class B standards for temperature, which was above the Aquatic Life Use temperature criterion. Concentrations of chemicals and metals in the creek have not been reported by the US Geological Survey since 1973; then they found low levels of lead, chromium and zinc, and did not find measurable amounts of copper in the water, which were the only metals that they reported (USGS, 1973). Seasonal rain in the drainage basin of Whatcom Creek leads to seasonal cycles in water-flow (COB, 2014) and sediment near the wharf (WSDOE, 2015). Water quality in Whatcom Creek is relevant to the health of the several species of salmon that spawn here (NOAA Fisheries West Coast Region & WA Department of Ecology, 2014) and the people that value the salmon spawn for its cultural significance.

Bellingham Bay water quality is regulated under the Clean Water Act and overseen by the WSDOE. The Whatcom Waterway is listed as an estuarine subtidal zone with an unconsolidated bottom of mostly small stones less than 7cm in diameter (USFWS, 2017). Currently, the Whatcom Waterway has been approved under the regulations of a Category 4a Total Maximum Daily Load with the EPA (WSDOE, 2015), indicating designated sediment toxicants are above regulatory limits but that the WSDOE has implemented an approved management practice, for instance, dredging and capping of contaminated sediments. The WSDOE lists 38 contaminants in the Whatcom Waterway including metals like chromium, cadmium, copper, zinc, PAHs and PCBs (WSDOE, 2015ab). In addition to the waterway, the soil adjacent to the wharf is heavily polluted with dioxins, furans, PAHs and metals, and groundwater was found to be acidic (Figure 6), which can increase mobility and bioavailability of metals in water (Li et al., 2013); these sources of contamination are contained from the waterway by gravel, asphalt, and impervious surfaces but may enter the waterway if the cap is removed during bulkhead removal or soil grading.

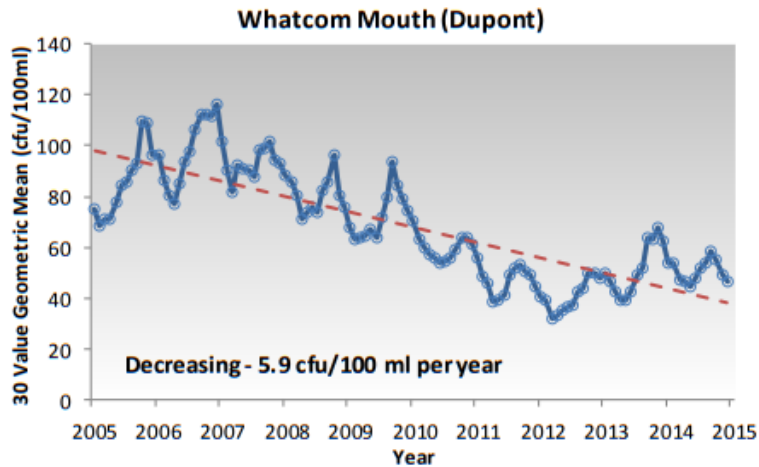


Figure 5: Fecal coliform bacteria (colony forming units [cfu]) trends in Whatcom Creek measured at Dupont Rd. near the estuary (COB, 2014).

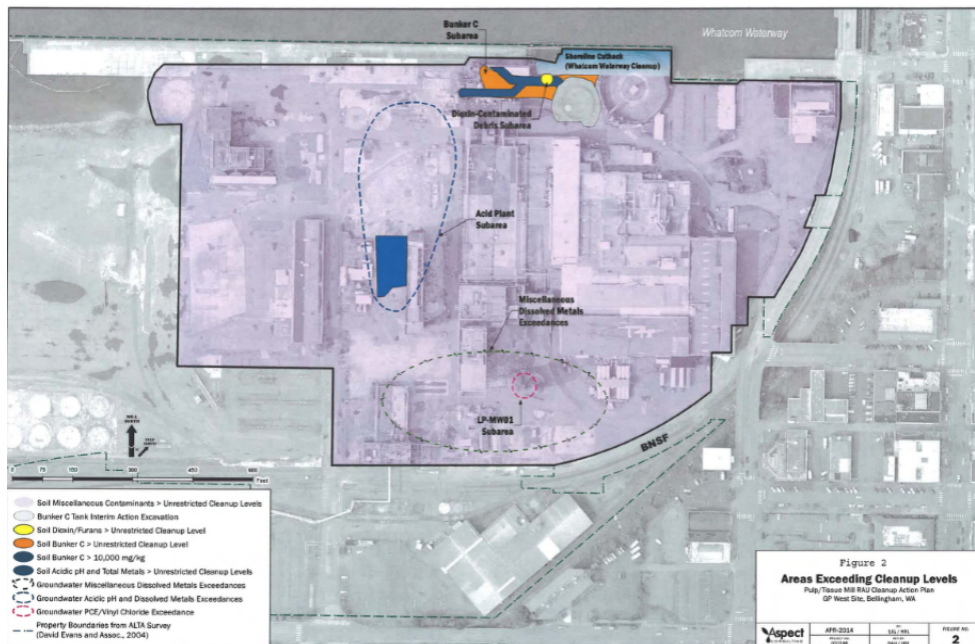


Figure 6: Contaminated soils and groundwater near the GP Wharf proposed action site at the top (north) of this map. Grading and bulkhead removal near wharf may lead to increased leaching of heavy metals, acids, VOCs, PAHs and dioxins into the Whatcom Waterway (north of wharf) (Port of Bellingham, 2014).

**Proposed Action**

**Impacts**

Short-term impacts from wharf and bulkhead removal, grading and installation of seawalk will not lead to changes in water quality for Whatcom Creek as its watershed is above the Whatcom Waterway. Possible impacts to the Whatcom Waterway due to piling removal and restructuring of the shore are increased turbidity from suspended particles and relocation of deposited sediments which



may affect the drainage into Bellingham Bay in the short term. Other impacts may be from the release of creosote on certain pilings that were never replaced with concrete pilings during GP's normal maintenance of the wharf (Robinson and Shoemaker, 2014), and from disturbing the gravel cap which separates the bay from contaminated sediments (WSDOE, 2015b). Contractors may employ barge-mounted cranes to remove pilings, which may lead to petroleum leaks on the waterway. Some bulkheads may be removed and grading on the created shoreline would be required, which may lead to release of metal and dioxin-contaminated and/or highly acidic groundwater. Salmon, harbor seals, and other marine organisms that inhabit the waterway may be negatively impacted by exposure to contaminants during construction. Waterway impacts will be temporary during construction and will lead to overall improvement of water quality over the long-term due to the removal of creosote pilings and the management of the failing condition of the wharf.

Impacts to surface water during construction may be petroleum leaks from construction equipment and automobile traffic throughout the project, asphalt and concrete dust during the removal phase and fugitive dust from contaminated soil during grading (FEMA, 2006). Groundwater is capped from interacting with surface runoff and the bay with gravel, tarps and asphalt, so impacts will be negligible (POB, 2014). These impacts to the surface water will be temporary and mitigated by the collection and treatment of surface water in ASB before release to the bay.

### **Mitigation**

The asphalt/gravel cap will be maintained over contaminated groundwater adjacent to the wharf at all times, and after piling replacement and installation, the marine gravel cap will be re-established with clean sand to reduce creosote leaching (WDFW, 2015). During creosote-piling removal, contractors will use absorbent fabric and other measures to contain contaminated water and treat contaminated water in the ASB. All lumber installed in, above or near the waterway will meet minimum BMP standards (WDFW, 2015). The seafloor cap will use locally-sourced medium, round pebbles to encourage plant growth and habitation by animals, as well as separating marine animals and benthic organisms from exposure to dioxins (WSDOE, 2015b). Many of the existing pilings of the wharf will be retained in the seawalk when possible and new pilings will be located in previous piling holes to reduce the footprint and limit sediment suspension in the water column, which could otherwise lead to increased exposure of marine life to contaminants. In addition, Washington Department of Fish and Wildlife will survey the waterway to ensure that no sensitive species will be affected, such as herring, smelt and sand lance (WDFW, 2015). All surface water will be collected at the pumphouse and treated in the ASB in accordance with current practices onsite. Marine water quality below the wharf, tissue bioaccumulation and groundwater quality in the uplands portion of the GP site will continue to be monitored for up to 30 years in accordance with the Model Toxics Control Act (Port of Bellingham, 2014).

### ***Alternative: Shoreline Improvement***

#### **Impacts**

Short term impacts to water quality from wharf removal and shoreline improvement will be greater than impacts from the seawalk, due to increased asphalt and soil grading that will be required to establish gradual slopes and shoreline erosion control. These practices may lead to greater chances of soil and groundwater contaminant release into the waterway, as well as the introduction of more construction by-products like asphalt-derived PAHs, metals and concrete dust (CDC, 2000). All pilings and bulkheads near the wharf site would be removed, increasing the water quality of the waterway in

the long-term due to reduced sources of creosote-contamination and increased habitat for shore-stabilizing marine and terrestrial plants; however, the waterway would be subjected to more contamination from construction equipment, soil, acidic groundwater and construction-material removal in the short-term.

**Mitigation**

All surface-water and contaminated water from creosote and asphalt removal will be collected and treated in the ASB, limiting exposure of contaminants to the marine environment. Creosote piling and bulkhead removal would improve water quality in the long term. In addition to mitigation listed in the previous section, shoreline improvement will lead to installation of erosion mesh and riprap along a greater area than the seawalk and may lead to the establishment of marine and terrestrial plants, all of which decrease erosion and add to the stabilization of contaminated soil upland.

***Alternative: No Action*****Impacts**

In the no action alternative, the waterway and surface waters will not be impacted by construction equipment or the disturbance of the asphalt-gravel cap above the contaminated soil and acidic groundwater (Port of Bellingham, 2014). This alternative will not lead to possible spills from large construction equipment. However, over the long-term, the waterway may be subject to contamination from the material used to build the wharf (PAHs, silica and metals in asphalt and pilings) (CDC, 2000 and Robinson, Shoemaker, 2014) and the soil from behind the failing bulkheads as the conditions of the wharf continue to deteriorate.

**Mitigation**

The Port of Bellingham will have to perform repairs on the failing wharf to comply with Federal regulations on pollution and transportation in federal waterways (Rivers and Harbors Appropriation Act of 1899, and CWA, 1972). Short-term construction impacts will not need to be mitigated as in the proposed action and shoreline improvement alternative.

### 3.4 Plants

This section identifies the current plant conditions at the GP Wharf site as well as surrounding conditions. The potential impacts and mitigations for the proposed seawalk, improved shoreline and no action are also identified.

#### Current Conditions

The entire GP Wharf site was created from deposited fill; weedy vegetation growing through the urban land comprise all of the plants on the wharf and currently exist in very low densities. In the Whatcom Waterway along the GP Wharf site, *Zostera marina* seagrass and mixed algae including *Ulva sp.* are present (Figures 7 and 8). North of the GP Wharf at Maritime Heritage Park is the Native Plant Trail that includes many plants that have been in the state since before European settlement. The trail runs along the riparian habitat that is critical for streamline stabilization of banks, sediment and pollutant filtration, and habitat improvement for local animal species. Plants that are found along the Native Plant Trail include Baldhip Rose, Beach Strawberry, Black Hawthorne and many more (City of Bellingham Trail Guide, 2017). There are currently no trees along the wharf for birds to land in so they are using the wharf as a stopping ground along the waterfront.

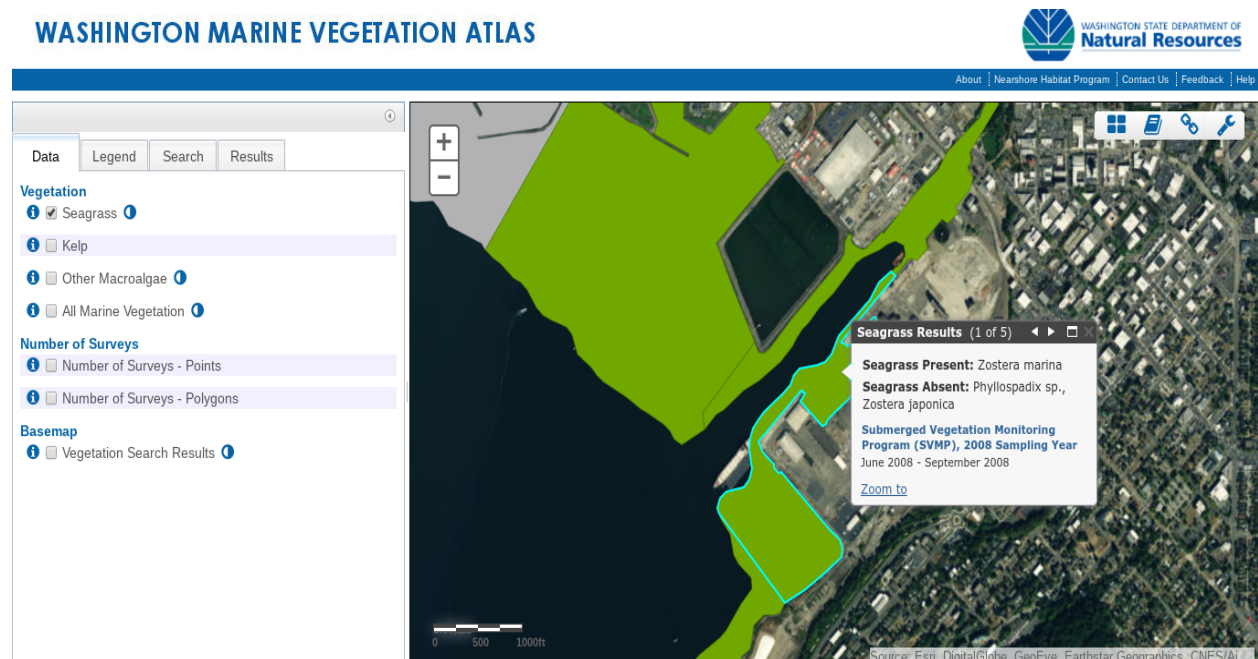


Figure 7: Seagrass results indicating the presence of *Zostera marina*, from Washington Marine Vegetation Atlas (Washington Marine Vegetation Atlas, 2017).

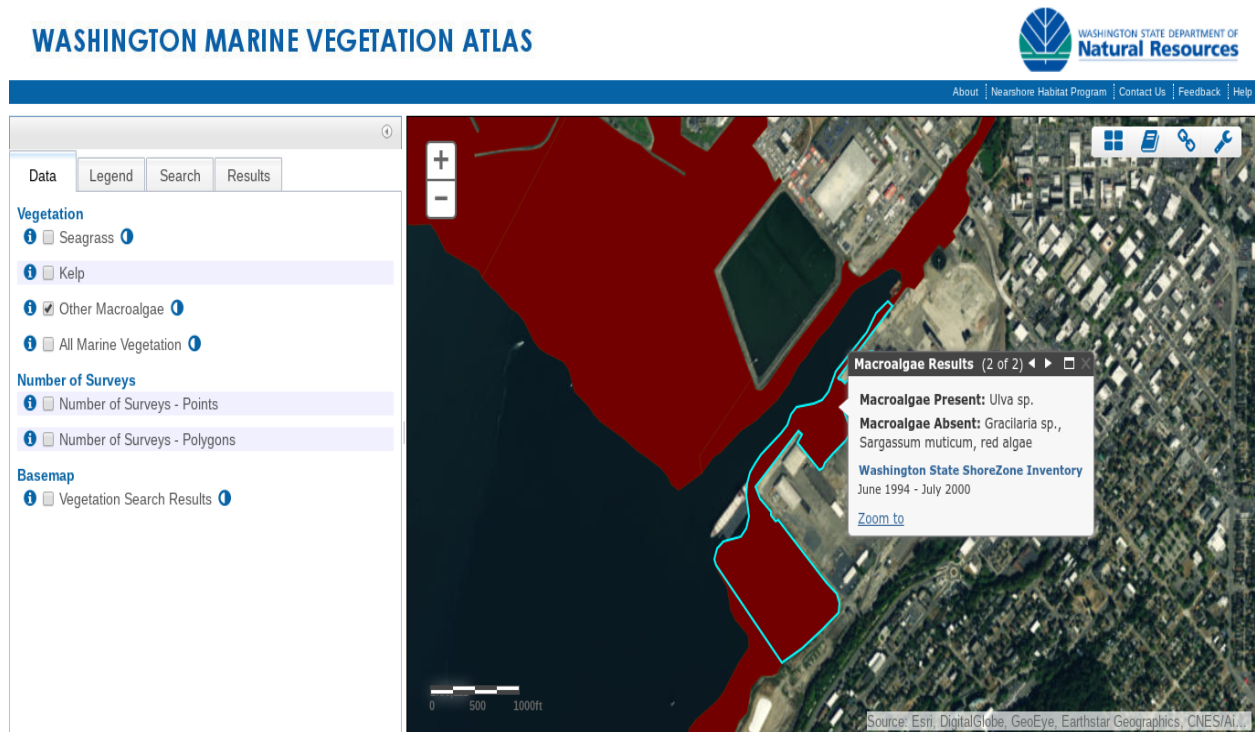


Figure 8: Macroalgae map of the wharf site from Washington Marine Vegetation Atlas and the presence of *Ulva* species (Washington Marine Vegetation Atlas, 2017).

## Proposed Action

### Impacts

The replacement of the wharf would remove all of the weeds that are growing in the concrete at the current wharf. There is also the potential that some or all of the native seagrass and algae that is present in the water next to the wharf could be removed or disturbed during the replacement, from creosote leaching, or increased turbidity. Native plant species will be added along the seawalk adding vegetation at the GP Wharf. New vegetation will establish the ground under the wharf and help reduce erosion potential (Port of Bellingham, 2008). An increase in vegetation will provide new habitat in water and on the wharf site for migratory birds and organisms living in the Whatcom Waterway.

### Mitigation

New vegetation along the wharf will be planted. The same native plants that are along the Native Plant Trail and at the adjacent Waypoint Park can be utilized to reduce impacts from invasive species and promote the local ecology. These plants can include salal, baldhip rose, salmonberry, black Hawthorn and more, as listed above. Seagrass may need to be reseeded along the shoreline to rebuild previous populations if a majority of seagrass is depleted during construction.

***Alternative: Shoreline Improvement*****Impacts**

The shoreline improvement alternative would include riprap in the form of large boulders and rock placed along the shoreline with a sidewalk running along it. Removal of the wharf will subsequently remove all weeds that exist on top of the wharf. The demolition of the wharf could leach creosote into the waterway and increase turbidity impacting the marine plants present in the Whatcom Waterway. Removal of the wharf will reduce the overwater structures that are blocking sunlight into the water. The improved shoreline would provide space for new vegetation to be planted along the walkway to help reduce erosion impacts and stabilize the soil (Port of Bellingham, 2008).

**Mitigation**

Examples of native plant species that can be transplanted or seeded above and in the riprap can be found at the Native Plant Trail north of the wharf in Maritime Heritage Park. Native plants that can be utilized can include Salal, Salmonberry, Black Hawthorn, and more. This report recommends the inclusion of native vegetation along the trail to collect rainwater and reduce impervious surfaces. Marine plants would need to be reseeded and monitored to ensure continuous growth after the removal of the wharf.

***Alternative: No Action***

**Impacts** The weeds that are already present in the wharf will continue to spread into the cracks along the wharf. The creosote pilings will continue to leach into the waterway impacting the marine vegetation.

**Mitigation**

The no action alternative will not have any construction impacts. Continued monitoring of the seagrass and algae is recommended to ensure pollution does not disrupt healthy population and ecosystem dynamics among the marine ecology.

### 3.5 Animals

This section details the current fauna at the GP site and how the proposed seawalk, shoreline improvement, and no action alternatives alter their ability to function individually as part of the ecosystem. Proposed mitigations to these impacts are also discussed and recommended.

#### **Current Conditions**

Presently, this site is used by urban fauna such as pigeons, starlings, house sparrows, gulls, and rodents, as well as marine fauna including harbor seals, shellfish, salmon and local fish, and black oystercatchers (all observed at the site by team member observations). This site has significant potential for habitat improvement and increased fauna appearance, as well as improvement for local species including salmon and seals. This project aims to improve the shoreline for local species habitat while making it accessible for human use.

*Animals observed at this site location (from team-member observations and WSDFW Marine Area 7 Report):*

**Birds** - Osprey, Great blue heron, gulls (Laughing, California, Glaucous, for example), Black oystercatchers, Double-crested cormorants, Dark-eyed Junco, Song sparrow, House sparrow, American crow, rock-dove (Pigeon), European starling. Bald eagles are known to use this waterway as food source and migration corridor.

**Mammals** - Harbor seal, field mouse, brown rat, Western grey squirrel. Resident orcas are known to use this waterway as food source and migration corridor, though commonly deterred by boat traffic and noise pollution (EPA Salish Sea, 2017).

**Fish and marine organisms** - Salmon (several Pacific species, including Chinook, Sockeye and Pink), anadromous trout, shellfish (including mussels, clams, limpets), and benthic marine organisms such as sea stars, marine worms, crabs, shrimp, etc. (NOAA Fisheries West Coast Region & WA Department of Ecology, 2014). Puget Sound Chinook salmon are listed as “threatened” under the Endangered Species Act, and this specific population is marked as an “evolutionary significant unit” (ESU) meaning this population has a naturally spawning genetic variety of this species, in addition to hatchery programs (NOAA Fisheries, West Coast Region, *Puget Sound Chinook*, 2017). Additionally, Bellingham Bay falls under “critical habitat” for Chinook salmon, giving this population and this habitat extra protection under the ESA (NOAA Fisheries, 2016).



Figure 9: Harbor seals in downtown Bellingham. J. Farrer, WWU.

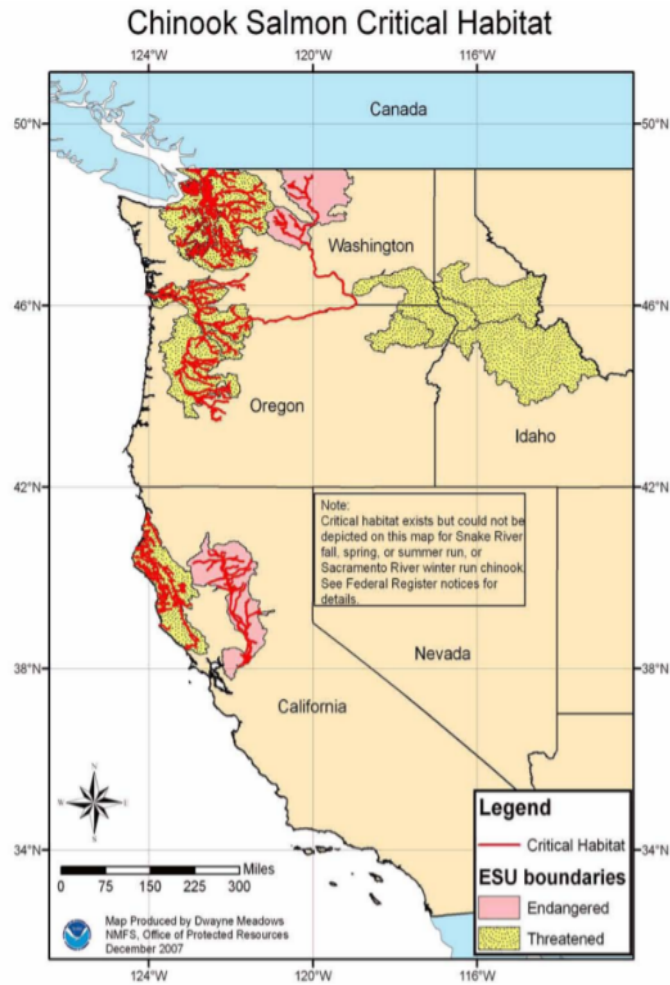


Figure 10: Chinook Salmon Critical Habitat

Credit: Dwayne Meadows, NOAA: Office of Protected Resources, 2007

## ***Proposed Action***

### **Impacts**

Demolition of the old wharf and construction of the seawalk will cause some disruption to the shoreline and water; removing the old pilings will dredge ocean sediment and disrupt sessile organisms (such as anemone, mussels, and barnacles) on the pilings and seafloor. It will cause increased sediment flow into the bay during the construction period, which reduces visibility and planktonic foraging for marine organisms. It also may cause noise pollution for the marine mammals and spawning salmon returning during the winter months, potentially driving marine mammals away from and reducing hunting success around this site. After the construction, additional moorage pilings and the replaced dock pilings will provide habitat for sessile marine organisms and harbor seal haul-outs. The improved habitat bordering the site will provide songbird and small mammal habitat, as well as increased cobble berms for invertebrate habitat.

### **Mitigation**

This report recommends that GP Wharf demolition and reconstruction be done in a way to minimize damage to the seafloor and any present eelgrass habitat. Standing pilings from the old wharf will be left on the sea floor to allow continued growth for the sessile organisms attached to them. Floating log moorings will be attached to the dock to provide haul-outs for seals in addition to the ones already present at the site. Large cobble rocks will be increased on the shoreline to provide habitat for invertebrates and act as a beach berm. Planting native plants around the site can increase habitat for: native bird species with shrubs such as salmonberry, salal, red-alder and mountain-ash trees, Indian plum; and pollinators, with plants such as mountain astor, Nootka rose, yarrow, lupin, wood-sorrel and oxeye daisy. The Port of Bellingham could manage the wharf's restoration to protect chinook salmon from exposure to not only physical hazards such as barriers to spawning in the Whatcom Creek or sharp, corroded steel, but also to chemical hazards such as heavy metals like chromium or PAHs in the asphalt and in the soil behind the bulkheads; these hazards also threaten harbor seals that use the Whatcom Waterway.

Construction of the seawalk and new wharf can be done carefully, even if this means slower efficiency, to ensure that the seafloor beneath receives minimal damage from the demolition and construction, to maximize habitat protection. Materials for building can minimize use of environmental toxics such as paint, metal contaminants, or wood-stain to protect the shoreline and marine habitat. Consulting an environmental toxicologist is recommended before and during construction. After demolition of old structures and construction of the new seawalk, the specified native plants can be added around the perimeter to encourage habitat coverage.

## ***Alternative: Shoreline Improvement***

### **Impacts**

Removal of the pilings and existing dock will dredge sediment into the bay, lowering visibility and planktonic foraging for marine organisms as well as producing sound pollution that may deter marine mammal hunting. After the initial removal, however, the increased new sediment and removal



of creosote pilings will improve conditions for marine organisms living in this stretch of bay. Native trees, shrubs, and perennials would be planted to increase habitat coverage for native species and attract pollinators to this urban area.

**Mitigation**

In this alternative, though the dock feature will be removed and the pilings removed from their mounts, the cement (non-creosote/stained) pilings would be left to rest on the seafloor to continue being habitat for sessile organisms. The introduction of native plant species should allow additional habitat to protect species impacted by the removal of this site.

***Alternative: No Action*****Impacts**

No impacts are identified by this report to be associated with the continued existence of the wharf in its dilapidated condition at the waterfront.

### 3.6 Energy and Natural Resources

This section outlines the energy requirements of the proposed action and alternatives and identifies any nearby energy sources. It also discusses the impacts on environmental dimensions of this energy use, and ways they can be mitigated.

#### Current Conditions

The only powered structure on the wharf is the pumphouse, which collects runoff from the uplands portion of the GP site and pumps it to the Aerated Stabilization Basin (ASB) on the west side of the Whatcom Waterway. The amount of power currently used by the pumphouse is unknown. Puget Sound Energy (PSE) supplies power to the wharf's pumphouse currently, through a mix of fossil fuels and renewable sources. PSE does operate a natural gas power plant to the southeast of the wharf (Figure 11). This site, called the Encogen Generating Station, is a combined-cycle combustion turbine plant capable of generating up to 165 megawatts of electricity (at full capacity). It is mainly used to supplement electricity supply at times of peak demand (Puget Sound Energy, 2013).



Figure 11: Proximity of Encogen Generating Station to Georgia-Pacific Site, Wharf, and Downtown (City of Bellingham, 2017) [Encogen outlined in turquoise, former GP site shown in green, GP Wharf in orange]

#### Proposed Action

##### Impacts

While the wharf's current electrical use is minimal, proposed changes may affect that. Electricity must be supplied for the concert stage and lighting. The concert stage will require intermittent but considerable power. This may require digging power lines and connecting to the grid, which could upset the acid plume in the groundwater on the portion of the uplands site directly adjacent to the wharf (see

section 3.1). The electricity used may also be associated with fossil fuel usage, as the energy mix of PSE, the local utility, contains fossil fuel sources (see Figure 12).

The proximity of the Encogen Generating Station, a natural gas plant, increases the likelihood that power supplied to the wharf would be generated by fossil fuels, releasing potent greenhouse gases (GHG) like carbon dioxide and methane. GHGs contribute to climate change by trapping the sun's energy in the atmosphere instead of allowing it to radiate safely out to space. Burning fossil fuels such as coal also release particulate matter levels in areas where the fossil fuel-based production is taking place. While the damages associated with climate change are estimated to be significant, the contribution of the proposed action would be entirely negligible in the scope of global emissions. Locally, increased emissions of nitrogen oxides, carbon monoxide, and volatile organic compounds (VOC) can be expected, depending on the efficiency of the Encogen Generating Station. Nitrogen oxides are associated with ground-level ozone, a health hazard, and contribute to smog and acid rain. Breathing air with high levels of VOCs and/or NO<sub>2</sub> can irritate respiratory pathways ("Basic Information about NO<sub>2</sub>"). Generation of particulate matter and sulfur oxides, while a concern with other fossil fuels such as coal, are not very significant with the combustion of natural gas ("Air Emissions Factors and Quantification").

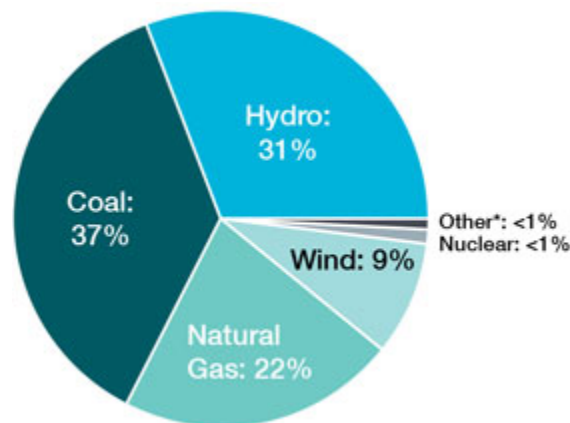


Figure 12: 2016 PSE Energy Mix (Puget Sound Energy, 2016)

Construction to build the wharf will also require the use of equipment that require fossil fuels. Trucks with supplies will need to service the area, and both land- and sea-based construction equipment will be necessary to complete construction. These machines often run on diesel power, contributing to both emissions of GHGs and other toxins such as sulfur dioxides and irritants like particulate matter.

### Mitigation

While impacts from the electrical requirements of the wharf are minimal, they can be further reduced by incorporating renewable energy into the design of the seawalk. This would serve to not only educate visitors and connect with local businesses, such as the newly relocated (to the waterfront) solar panel manufacturer, Itek Energy, but also to minimize the use of polluting energy sources at the wharf. Building renewable energy into the wharf could take two forms - solar powered lighting and rooftop solar for the concert stage. An example of solar powered street and park lighting can be seen in Figure 13. Solar panels, alongside lithium battery storage, are already used at many major music festivals around the world, and could easily handle the load of a local concert stage (Brownstone, 2017). If the

wharf can be completely powered by renewable energy, then digging to lay transmission wires would be minimized near the acidic groundwater in the uplands. However, this digging may be unavoidable do to the need to put in utilities for other projects on the GP site. Regardless, increasing the renewable presence would reduce the carbon and toxic (nitrogen oxides and VOCs) footprint of the wharf, while educating the public on the practical benefits of renewable energy. Information tiles can be added to the southern end of the wharf indicating how and why the wharf is powered by solar energy, spreading education on climate change and ways communities can combat it.



Figure 13: Examples of Solar Street Lighting Available to Consumers and City Planners (Greenshine Solar).

### ***Alternative: Shoreline Improvement***

#### **Impacts**

A shoreline improvement would not require significant increases in electric power, except for trail lighting that would run along the edge of the riprap. This would not affect the Encogen Generating Station, nor would it increase emissions by any significant amount as to require mitigation.

#### **Mitigation**

Trail lights could be powered through solar instead of being attached to the grid, eliminating any concern over emissions from fossil fuel generation.

### ***Alternative: No Action***

#### **Impacts**

This action would have no bearing on energy use under the No Action alternative.

## 4.0 Elements of the Built Environment

The following section discusses the elements of the built environment. The built environment of the proposal focuses on these dimensions laid out by the SEPA checklist: environmental health, land and shoreline use, light and glare, recreation, historic and cultural preservation, transportation, and utilities. As per Washington State's Environmental Policy Act, the permits for the area will be taken into consideration, as well as the jurisdictions of the state and federal governments.

### 4.1 Environmental Health

This section explores the potential impacts and mitigation measures applicable to those working and visiting the site during construction and operation for the project proposal, shoreline improvement, and no action alternatives.

#### **Current Conditions**

The Georgia Pacific Wharf site as of right now is not at the point of causing harm to those around the site. The site was severely contaminated with polycyclic aromatic hydrocarbons (PAHs), dioxins, furans, and heavy metals (arsenic, cadmium, copper, mercury, nickel, zinc and lead), all of which have been measured at concentrations exceeding limits of groundwater, soil, and marine protection. This is problematic for the future because the current condition of the wharf is heavily damaged and there is a strong possibility that pilings will continue to break away, causing leaching to occur into Bellingham Bay.

#### **Proposed Action**

#### **Impacts**

The plan includes the removal of the wharf in its entirety to reconstruct the wharf into a much stronger seawalk that would could not be eroded so easily. With construction, there is a strong possibility that there will be some exposure to the capped contamination near the wharf. Considering the fact that most, if not all of these contaminants are known human health hazards, there must be precautions taken in order to remediate possible exposure to construction workers. There must also be attention to possible leaching into the bay as pilings are removed in order to help preserve the marine ecosystem. These contaminants are well-known and will not affect the finalization of the proposed action. After construction is finished there will not be any chemicals stored or used near the wharf. With the construction of the wharf, some storage will be required to hold petroleum products such as lubrication and fuel.

#### **Mitigation**

This report recommends that attempts be made to prevent any direct contact with the contaminated soils or the groundwater to construction workers. BMPs will be used to address erosion on the pilings as well as the capped soil near the waterway. Additionally, POB has already committed to

continual monitoring of the groundwater to ensure that no contaminants leach into the bay during the project as well as after the newly constructed wharf has been completed.

***Alternative: Shoreline Improvement***

**Impacts**

With the shoreline improvement plan, there will still be construction to completely remove the wharf and pushed the shore back to the capped area. The area of the wharf will be replaced with a riprap revetment to create an improved shoreline, as compared to the current state of the wharf. There is a strong possibility that with the destruction of the wharf the contaminated soil will be exposed to construction workers near or around the wharf. While exposure concerns are significant during construction, there should not be any further exposure to these dangerous carcinogens, barring any unforeseeable erosion damage to the contaminated soil, during normal operation of the shoreline.

**Mitigation**

BMPs can be put in place to minimize exposure to these harmful chemicals to the workers as well as the groundwater nearby. Actions can also be taken in order to prevent the public from wandering into or near the hazardous site during the construction.

***Alternative: No Action***

**Impacts**

The wharf will inevitably fall into the ocean and leaching is likely to occur from the capped land that is next to the wharf. With such a drastic problem, this will affect workers nearby as well as contaminate the groundwater and waterway, causing problems for organisms in the water as well.

**Mitigation**

Since nobody will be allowed near the wharf as is currently in place, people nearby should not be concerned about their health until the wharf collapses and leaches into the waterway and air around the site. We recommend that there is something done to prevent such problems to occur in the waterway for the sake of ecosystems as well as the citizens nearby possibly being exposed to such harmful carcinogens.

## 4.2 Land and Shoreline Use

This section outlines the zoning classification and current use of this Georgia Pacific Mill site, the proposed project's alterations and mitigations of the shoreline, and the potential impacts from improving the shoreline back to natural habitat.

### **Current Conditions**

The old Georgia Pacific mill and wharf site currently belong to the Port of Bellingham and the City of Bellingham. This site contains the Georgia-Pacific Wharf along the waterway (which is in a dilapidated condition), the concrete walkway (in varied condition), the moorage stations, gate opening to W. Laurel Street, and the pumphouse, which contains pumps that transfer stormwater to the ASB on the east side of Whatcom Waterway. Adjacent to the site are the "acid ball" art installment at the upcoming Waypoint Park, the Georgia-Pacific mill building, the attached processing silos, and the separate storage silo (which may be demolished or kept according to the design of the Waypoint Park development project).

The pre-inspection findings from the Port of Bellingham's GP Condition Assessment Report called replacing the wharf's timber piles and rebuilding the damaged bulkhead a "high priority basis with urgency" before further construction, loading, or pedestrian use can go forward (Moffat and Nichol, 2015, 19). At least part of the pilings, if not all of the GP wharf, will need to be demolished and replaced before it is fit for pedestrian access. Most of the existing pilings are unsafe, and the overall structural integrity of the wharf's components (such as the "pile-to-pile cap connection", and installing "structural jackets") earned "moderate urgency" replacement suggestions (Moffat and Nichol, 2015, 19). Depending on the finished scope of the seawalk, hundreds of visitors could enjoy it over the course of a busy day, especially if the residential area is completed nearby. Therefore, we strongly recommend replacing the whole wharf structure.

This zone is classified by the City of Bellingham (COB) as "Waterfront district industrial mixed use (log pond) (industrial mix)" (City of Bellingham, 2017) (Figure 14). Under the jurisdiction of the Port of Bellingham (POB), this site is in mixed-use for moorage access and future pedestrian recreational opportunities under the City of Bellingham. Additionally, the COB has plans to turn the GP mill site into a residential and park community, with dwellings and business property. This site is listed as a "Model Toxic Control Act (MTCA)" site due to the mercury, acid, and other post-industrial toxic substances still present in the ground from the GP Mill (City of Bellingham, 2017).

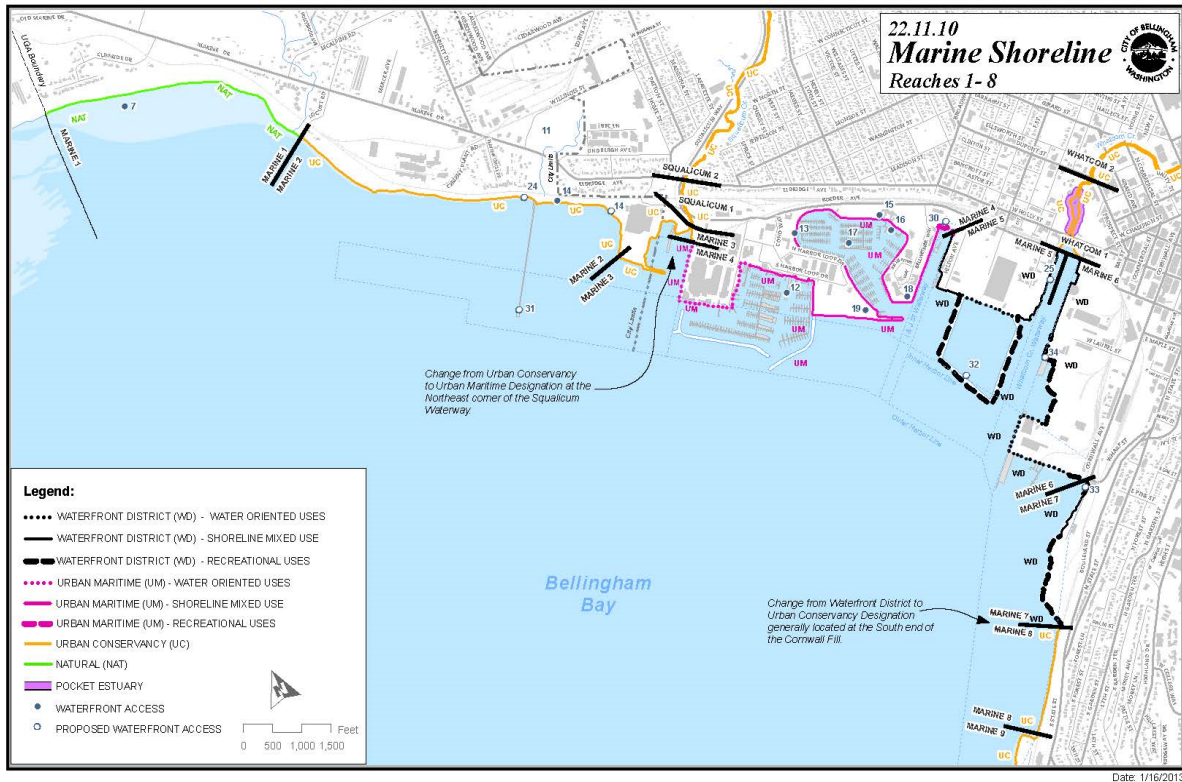


Figure 14: Bellingham Bay shoreline zoning designations.  
City of Bellingham, Shoreline Master Program: Marine Map 1, 2013 (PDF)

## Proposed Action

### Impacts

The wharf is only used for moorings of a few private vessels at the time of this report. The property adjacent to the wharf belongs to an energy company, Encogen, and a POB log mill; neither should be impacted by the establishment of a city park, since it is not immediately proximal and is fenced off. Though nobody would be living on the wharf or nearby Waypoint Park (to the north of the wharf site), if the residential buildings are completed in the former GP Mill site, it could several hundred new residents proximal to this project site. This would mean increased population density and business traffic downtown, which would benefit local businesses. Though the Encogen building and log mill may experience increased street traffic and need to improve their circumference barriers to prevent pedestrian trespassing, this increased density should not significantly impact their business.

### Mitigation

If both parks projects are completed, especially if residential and/or commercial development begins in the former GP Mill site, then the boundaries of the log pond could be fenced off to prevent pedestrian danger or trespassing. The Encogen generating station is currently fenced off.



***Alternative: Shoreline Improvement*****Impacts**

To establish a more ecological shoreline improvement, the project would continue with removing the existing wharf and its related structures, but leave the pumphouse as mandated. An increased environmental cap of cobble, gravel, and organic soil will be added over the removed wharf structures. Then, native shoreline vegetation (reed grass, salal, red-alder, salmonberry, etc.) will be planted to encourage native species habitat. This will be in addition to Waypoint Park's habitat improvement, so coordination between the two projects is necessary to ensure ideal habitat continuity. This increase in habitat and potential species may provide grounds for natural recreation opportunities, such as bird-watching and walking. It would serve as a natural, aesthetically-pleasing barrier between the proposed Waypoint Park and the POB log mill and Encogen building.

**Mitigation**

This report recommends creating a fencing structure to deter pedestrians from the planned nearby Waypoint Park from encroaching on the habitat restoration at this site. After wharf structures are removed as specified above, this would no longer be necessary to protect ecosystem shoreline use.

***Alternative: No Action*****Impacts**

Wharf structures will continue to remain as home for sessile marine organisms and haul-outs for harbor seals under the no action alternative. The existing environmental cap will remain to deter continuing contamination from the GP mill. This will have no bearing on the operation of the commercial wharf to the southwest of the wharf. However, the wharf, in its current condition, is unsightly and deteriorating relatively quickly. As the Waterfront District is meant to draw in tourists, new businesses, and residential housing, having an unsightly, out of commission wharf on the namesake of the district (the waterfront) will have a negative impact on local business. Most likely it will take longer for businesses to decide to locate in the Waterfront District due to the lack of aesthetic appeal.

**Mitigation**

As the impacts directly interfere with adjacent land and shoreline uses as defined in the Waterfront District Subarea plan, this report recommends that actions are taken to improve the aesthetic appeal of the wharf if no removal or renovation is to occur. This could include walling off the wharf with native vegetation or an art wall utilizing local art such as discussed in section 4.5.

## 4.3 Light and Glare

This section identifies potential impacts and mitigations related to the proposed action and alternatives with regards to sources of on-site and off-site light and glare, such as those on the local ecology and built environment.

### **Current Conditions**

The wharf has been essentially inactive since GP closed down operations in 2007, so there are no sources of light or glare on-site. Very occasionally, small boats may dock at the northern end of the wharf, where a temporary additional dock has been created, but this is during the day time and does not increase light or glare by any environmentally significant amount. The only current sources of light and glare off-site are ambient light from the nearby downtown area, which is over a thousand feet away from the site of the wharf, and from shipping vessels docked at the log pond just south of the wharf.

### **Proposed Action**

#### **Impacts**

The main point of interest for light in the proposed seawalk is the concert stage at the northern end of the wharf. Although while inactive the concert stage will not contribute any light pollution, when it is in use during public events it will contribute a significant amount of light. Most public events utilizing the stage will happen in late afternoon and early evening hours, when the sun is setting. Therefore, light levels will be artificially high. This will affect local wildlife and the residents of any housing that may be put in across Granary Ave from the wharf.

Other street lighting may pose an issue to wildlife, as the wharf will be lit during all dark hours to create a safe environment. This lighting will be significantly brighter than the currently non-lit wharf. This ambient light pollution reduces stellar visibility and has known impacts on diurnal and nocturnal wildlife alike.

A stipulation listed in the Department of Ecology's Shoreline Management Program (SMP) handbook states that "materials that will allow light to pass through the deck may be required where width exceeds 4 feet" and that "dock surfaces designed to allow maximum light penetration shall be used on walkways or gangplanks in nearshore areas" (DOE Ch. 12). This may allow artificial light to upset wildlife in the water below during nighttime hours, when artificial light is the most obtrusive.

The proposed action will have no effect on the commercial shipping vessels docked south of the wharf at the log pond, but they will remain a source of light pollution when docked and in use.

Finally, construction will be a major, if temporary, source of light as the old wharf is removed and the seawalk is built. Any construction that takes place at night will be particularly impactful on the day-night cycles of local wildlife, as construction sites must be well-lit for safety purposes.

#### **Mitigation**

A major way to combat light pollution is through timing of lights. This report recommends that lighting should be off in day-time hours, brightest in the evening, and dim at night; enough to allow visibility but at the lowest possible levels during the nighttime to minimize impacts on wildlife. This is important when considering the concert stage: if stage operating hours are mostly before sunset with only limited time during evening and night hours, wildlife and local resident impacts will be minimized.

Placement is equally important: lights will be placed so that they do not shine directly onto the water, and even minimize reflections off of the seawalk. This can be accomplished by making lights inset in the guardrails of the wharf, similar to the lights at Taylor Dock, and having them face inward (Figure 15). Therefore, all light has been reflected once before it hits the seawalk, reducing the amount that can reflect off of the seawalk and become ambient light pollution. While the stipulation in the SMP handbook to build the dock out of light-passing materials will allow for natural moon- and sunlight to reach the water below the dock, offering a more natural environment to wildlife, this report recommends that the leakage of artificial light to the water below the seawalk be as limited as possible. This can be addressed through the angle of the lights to the horizon; lights should not be level with the horizon as this is correlated with higher levels of ambient light pollution, nor should they be angled too far down to point directly at the water through the light-passing material of the seawalk to mitigate impacts as effectively as possible. The previously mentioned inward-orientation of the lights will also serve to mitigate artificial light passing through the surface of the seawalk.

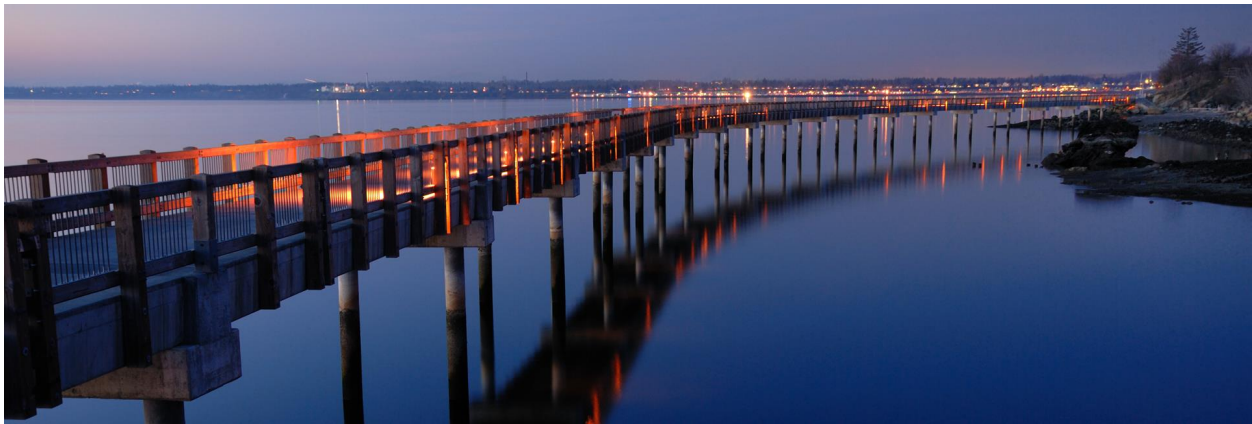


Figure 15: Example of acceptable ambient light levels at nearby Taylor Dock "Taylor dock at dusk" (City of Bellingham.) Retrieved from: <https://www.cob.org/services/recreation/parks-trails/Pages/boulevard-park.aspx>

In order to avoid light-related impacts from construction, this report recommends that most, if not all construction take place during daylight hours. This would minimize the amount of artificial light used on site and subsequently minimize effects on wildlife.

Finally, the spectrum of light emanating from the street lighting has significantly different effects. The blue light spectrum is much harsher on circadian rhythms and therefore has the most severe effect on wildlife, while warmer colors like yellow do less to interfere with the local ecology and humans alike. In order to combat this, this report recommends that Metal Halide (MH) and LEDs are avoided, as the light emitted by them has a higher blue content than traditional sodium lamps (Falchi, Cinzano, Elvidge, Keith, & Haim, 2011).

### **Alternative: Shoreline Improvement**

#### **Impacts**

The shoreline improvement will only differ marginally from the current state of the wharf in terms of light and glare. A finite but potent source of light pollution may come from the vessels and heavy machinery used to remove the wharf and reshape the coastline if they operate at night. During normal operation of the coastline, the only light will be street lighting placed along the trail going across

the top of the riprap. This will create ambient light pollution, reducing stellar visibility and affecting wildlife populations, similar to the impacts seen under the proposed action.

**Mitigation**

Mitigation measures can be very similar to those seen under the proposed action. This report recommends that construction take place during the day, so as not require bright lights and reduce ecosystem impacts. Trail lights can use proper dimensions of timing, placement, and visible spectrum to minimize impacts on local wildlife by only lighting when necessary, at the lowest levels necessary, using warm colors instead of blues, and placing the lights to minimize reflection off of the trail.

***Alternative: No Action*****Impacts**

No additional sources of light will be created under the no action alternative.

**Mitigation**

No mitigation is necessary due to no additional sources of light.

## 4.4 Recreation

This section identifies the current recreational conditions of the GP Wharf and the impacts of increased public access to the GP Wharf site for the proposed seawalk, shoreline improvement and no action alternatives.

### Current Conditions

The GP Wharf site does not have any public access, so no recreational activity is taking place. The closest place for recreational activity is at Maritime Heritage Park north of the wharf site, and soon at the adjacent Waypoint Park. The closest places to view the waterfront are from Chestnut St. at the bridge across the Whatcom Waterway and from a handful of businesses in downtown Bellingham. The only places to get down to the water closer to downtown are at Squalicum Marina northwest of the wharf and at Glass Beach located southeast of the Wharf. A waterfront trail extension from the wharf and Waypoint Park is possible in the event that the rest of the site is allowing. On Independence Day 2017, the Port of Bellingham opened up the GP Wharf site for public viewing of the firework display in Bellingham Bay.

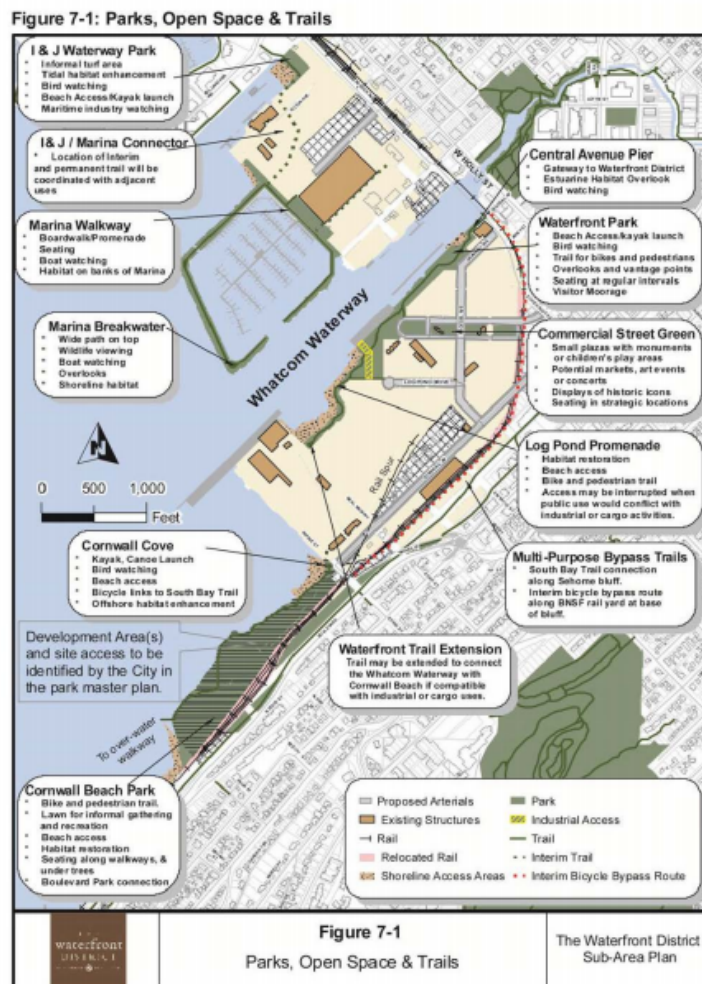


Figure 16. Sub-Area plan of the Bellingham Waterfront District including multi-purpose bypass trails and the waterfront trail extension (City of Bellingham, Port of Bellingham, 2013).

***Proposed Action*****Impacts**

The proposed project will provide space for increased recreation and access to the waterfront. Recreational opportunities for walking, jogging, and other forms of exercise will become available from the seawalk as well as the adjacent Waypoint Park. The seawalk will also provide additional areas to view the waterfront as well as connect the GP site with the rest of downtown and nearby beaches.

**Mitigation**

Making the new wharf wide enough for walking and biking can ensure smooth traffic without interruption. Including interpretive signage along the wharf to educate the public about what they are looking at in Bellingham Bay, the history, local renewable energy, and the local wildlife can capitalize on the seawalk as an educational opportunity and increase recreational benefits. Opportunities for adult exercise equipment along the wharf are possible, provided there is enough space along the wharf to implement.

***Alternative: Natural Shoreline*****Impacts**

The trail at Waypoint Park will continue along the riprap and improved shoreline extending the viewpoints of Bellingham Bay and increasing the area for exercise. The walkway would be gravel and the potential for vegetation along the trail is possible.

**Mitigation**

This report recommends that the trail extension from Waypoint Park be wide enough to allow walkers and bikers to utilize the trail at the same time. Interpretive signage can be placed along the trail to educate users about Bellingham Bay, local history, renewable energy, and wildlife to capitalize on the area as an educational opportunity.

***Alternative: No Action*****Impacts**

The no action alternative will have no changes to the current conditions. This will prevent the ability for the public to gain waterfront access near downtown Bellingham.

**Mitigation**

The no action alternative requires no changes to the current site, so no mitigation is necessary.

## 4.5 Historic and Cultural Preservation

### **Current Conditions**

There are not any specific landmarks of Native American significance in the project area. However, since the original waterfront once belonged to the Lummi Nation, this project should consult with tribes to determine if tribal historic preservation will be needed. The only recent historic landmarks to be considered for historic preservation are the artifacts retained from the old Georgia-Pacific facilities, such as the acid ball and silos adjacent to the project site, which could be maintained for aesthetic and historical value. Other assorted objects have been collected by the POB during the process of environmental cleanup undertaken since 2011 and can be utilized on-site.

At this specific project site, since no Lummi Nation historical value has been enumerated yet, the removal of the wharf structure and dock pilings will not disturb artifacts or culturally significant ground/waterway. There are no recent historical features of significant aesthetic value directly on this wharf site (since the GP acid ball and silos are adjacent to, but not included, in this project site and therefore out of the project's jurisdiction) aside from the welded art embedded in the sidewalk concrete outside the pumphouse. Those pieces of welded art are a unique remnant from the GP mill, created by a worker at the mill in their spare time.

### **Proposed Action:**

### **Impacts**

The proposed action integrates interpretive signage about Lummi Nation history and culture, designed with input from Lummi officials. Possible topics for inclusion on the signs include tribal history, legends, cultural activities, ocean significance, food harvest and cultural celebration. The only impact from this would be the addition of signs to the new wharf structure, which would have no additional impact on the land than the new wharf construction impact (building materials leakage, noise pollution, ocean-bottom dredging). The proposed action would increase the presence of historical actors at the wharf, such as the Georgia-Pacific mill and Lummi Nation's role on the Bellingham waterfront. GP artifacts from the factories would be placed along the landward side of the seawalk. These artifacts have potential to leach metals or other toxins, as they are part of the old GP pulp and tissue mill.

Construction could result in damage to the welded art around the pumphouse if not undertaken carefully.

### **Mitigation**

In order to avoid damaging the welding art outside the pumphouse, the construction around that cement could take care not to damage those metal panes by using BMPs, such as removing them during construction or clearly marking them if moving isn't feasible. Before any of the GP artifacts are relocated to the wharf, they could be tested to ensure they will not leach any known toxins when exposed to the elements.

***Alternative: Shoreline Improvement*****Impacts**

The existing structures of the wharf and surrounding concrete (except the pumphouse) would be removed and replaced with additional cobble, sediment, and plantings to increase native shoreline habitat. This removal will displace sessile marine organisms on the dock pilings and disturb macroinvertebrates in the affected ocean sediment. However, since neither the wharf nor the surrounding cement have significant historic value, their removal will not be disruptive. The only feature to be argued for continuation could be the welded art outside the pumphouse, which should remain regardless since the pumphouse must too.

**Mitigation**

Similar mitigations to the proposed action are applicable here. BMPs will be used by construction workers to ensure the protection of the welding art adjacent to the pumphouse.

***Alternative: No Action*****Impacts**

While the no action alternative will have no negative impacts as related to the current state of the site (in terms of historical and cultural preservation), it will be a lost opportunity to educate the community on the colonial and indigenous history of the Bellingham waterfront.



## 4.6 Transportation

This section discusses the impacts of increased transportation to the site due to the proposed action and alternatives. It also offers possible mitigation measures for those projected impacts

### **Current Conditions**

There are currently no roads that service the site, although the undeveloped GP site surrounding the wharf allows construction vehicles easy access to the wharf. Construction vehicles are able to enter from W Laurel St. and Central Ave., located on the eastern and northern ends of the GP site, respectively. These roads are also used to transport logs to a log pond south of the wharf. The nearest public transit location is the bus stop on the corner of Holly St. and Central Ave., just a block from the Granary Building where the future Waypoint Park will be located. Most waterborne traffic in the vicinity docks at the commercial harbor south of the GP Wharf, although a temporary commercial dock on the north end of the wharf does occasionally host small boats for short periods of time.

### **Proposed Action**

#### **Impacts**

Part of the entire Waterfront District Subarea Plan includes the establishment of roads to service the entire site. Granary Ave., W Laurel St., and W Myrtle St. are all future roads that will service the site (Figure 17). These will be tied directly to the current street system downtown and will have a dedicated bike path and wide sidewalks for pedestrian access, which is the main focus of the project's accessibility. Public transit is not currently under consideration for the project, with the current stop at Holly and Central planned to remain the closest stop to the site.



Figure 17: Map of proposed street placement on GP site (Gouran, 2017).

The proposal does not include any on-site parking in the long term. However, nearby gravel plots may be used for temporary parking while the new downtown is built up, and are planned for such uses (City of Bellingham and Port of Bellingham, 2013). Since this gravel is loose, erosion is likely until development is placed over the gravel cap. Constant motion from cars parking will upset this further, thinning the gravel cap and carrying any other chemicals, such as car oil, down towards the bay. Increased traffic both from construction vehicles and citizens (once the project is open to the public) will increase chances of contaminants entering runoff.

Especially of concern is the construction phase, where large machines will be coming in and out of the project area. These impacts are temporary, but construction machinery is slow-moving and large and can significantly impede traffic. The only roads that reach the site are through downtown, which already features relatively heavy traffic at peak hours. On main thoroughfares through downtown such as E Holly St., average daily traffic counts can be as high as 12,600 vehicles. On W Chestnut Street, which runs past the soon-to-be Granary Avenue, average daily traffic counts can be upwards of 7,200 (Whatcom Council of Governments, 2012).

Long term effects on transportation include the increased traffic to the waterfront. A goal stated in the Waterfront District Subarea plan is to have at least 40% of trips to the seawalk and surrounding areas be non-automobile, but this still indicates that 60% of trips to the waterfront will be from automobiles (City of Bellingham and Port of Bellingham, 2013). The area of the development on the GP site is not much smaller than the current downtown, and as the GP wharf, parks, and shopping on the waterfront are expected to be tourist draws, the additional traffic could be sizable. This increased traffic may have adverse effects on local residents and wildlife through noise, light, and air pollution, as articulated in sections 3.2, 3.5, 4.1, and 4.3.

## **Mitigation**

Successful mitigation can focus on controlling runoff from impervious surfaces as well as reducing the number of automobile trips to the area. Expanding public transit, ensuring the existence of bike lanes, and providing pedestrian access to the wharf can reduce automobile trips slightly. This is stipulated as a goal in the Waterfront District Subarea plan, so that mitigation is already internalized in the overall development of the GP site. The lack of dedicated parking for the wharf will disincentivize automobile traffic. The current plan to design the waterfront so that 40% of trips coming from non-automobile transport, through expansion of bike, sidewalk, and trail access will contribute to reducing automobile trips, but the effects on downtown traffic may be unavoidable without significant incentives to use public or private non-automobile transit. Unfortunately, there are no other feasible routes to the waterfront district without passing through downtown or along Roeder Ave and W Chestnut St, both of which already receive high amounts of traffic.

To mitigate the effects of construction vehicles on downtown congestion, construction vehicles can be moved at non-peak hours, such as early mornings before downtown businesses open or late at night after those businesses close.

The pumphouse on the existing wharf is responsible for collecting runoff from all over downtown and sending it to the ASB for processing, and this process should be made sure to continue to function over the totality of the GP site if current levels of stormwater management are to be continued. This involves expanding the network of stormwater lines and continual maintenance of the pumphouse. Erosion control will be greatly enhanced by developing buildings and permanent parking lots over the gravel uplands portion of the GP site (landward from the wharf).

***Alternative: Shoreline Improvement*****Impacts**

If the wharf is removed and replaced with a riprap revetment and coastal trail, there will likely be fewer visitors to the wharf itself. However, due to the proximity of the upcoming Waypoint Park near the Granary building (north of the wharf) and the ongoing development of the GP site into commercial and residential units, this alternative would most likely still result in significant increased transportation to the site through the bottleneck of downtown Bellingham's streets. Thus, similar impacts on traffic, erosion, and runoff control are applicable here, as they were under the proposed action. Utilizing the GP site as a temporary parking lot may increase erosion due to the gravel nature of the surface of the GP site cap. Oil and other runoff from vehicles can infiltrate ground- and surface waters under and nearby any parking on the upland portion of the GP site. The city would still have its stated goal of only 60% of trips to the site utilizing personal automobiles, but otherwise traffic would be similar to the impacts seen under the proposed action.

**Mitigation**

The proposed mitigations are also similar to the proposed action. This report recommends that the pumphouse is ensured to collect all runoff from the GP site, to minimize impacts of oils and other chemicals from vehicles. This entails any needed expansions of stormwater lines leading to the pumphouse underneath the GP site, and regular maintenance of the pumphouse. Developing on the gravel cap on the uplands portion of the GP site will control erosion from vehicle traffic. Increasing the percentage of non-automobile traffic to the waterfront, through increased public transit and bicycle/pedestrian/trail access, will mitigate traffic impacts on constricted downtown roads leading to the waterfront.

***Alternative: No Action*****Impacts**

Under the no action alternative, no impacts will be related to increased or decreased transportation to the wharf.

## 4.7 Utilities

This section identifies the utility requirements of the proposed action and alternatives and any associated impacts on the natural and built environment. It then proposed mitigations for the impacts to reduce the overall effect of an increased presence of utilities.

### **Current Conditions**

Although the site is not in use, there are varying levels of utilities left over from the previous owners of the site, Georgia-Pacific. While much of the infrastructure was dug out as part of the overall environmental cleanup and capping, starting in 2011 and extending partway into 2017, a COB-run stormwater utility pipe extends from the downtown network to a pumphouse located on the GP Wharf (see Figure 18) (Washington State Department of Ecology, 2017). Another network of stormwater pipes, owned and operated by the Port, delivers runoff from all over the GP West site to the pumphouse, but does not appear on Figure 18. This pumphouse is functional and pumps all stormwater to the Aerated Stabilization Basin (ASB) across the Whatcom Waterway from the wharf (Figure 18). There, any contaminants in the water are trapped by the walls of the basin, while water escapes through evaporation. The ASB traps these contaminants there through control of the amount of dissolved oxygen in the water. The pumphouse is powered by underground electrical lines originating on the western shoreline of the Whatcom Waterway.



Figure 18: Current storm water lines (pink) to pumphouse from downtown and GP site (green) and wharf (orange) (City of Bellingham, 2017).

## ***Proposed Action***

### **Impacts**

Per the Waterfront District Subarea plan, most if not all of the GP uplands site will be developed into commercial, residential, and public park land. This will entail a significant expansion of current utilities to the overall GP West site. The wharf, however, will not contribute much to this. Electrical demand will increase for the wharf as lighting and concert stage is implemented. Electricity is often generated using fossil fuels, which have detrimental effects on global climate and local air quality, and the local power mix that Puget Sound Energy utilizes does contain some coal- and natural gas-generated electricity (see section 3.6).

The stormwater network will be upgraded considerably for the overall GP site development, but the wharf will have no considerable contribution to that as most of it will be attributable to the residential and commercial development on the uplands portion of the site. However, the pumphouse is crucial to a functioning stormwater system and is located directly on the wharf. Any damage to the system during removal of the wharf/pilings and implementation of the seawalk would not allow the stormwater system to carry contaminated runoff offsite to the ASB.

### **Mitigation**

Ensuring the pumphouse remains operational during and after all construction would ensure proper functioning of the stormwater utility and optimally process contaminated runoff from the wharf site. Renewable energy, such as solar, was suggested in section 3.6 as a possible mitigation for electrical demand on the wharf. This could take the form of solar lighting and a rooftop solar-lithium battery storage combination for the concert stage, also discussed at length in section 3.6. Powering the wharf entirely through renewable energy can be done and would eliminate any associated impacts from expanding the electrical network, such as emissions from fossil fuel-generated electricity.

Upgrading the stormwater network is not associated with any negative impacts and therefore no mitigations are proposed.

## ***Alternative: Shoreline Improvement***

### **Impacts**

The shoreline improvement alternative would have limited impacts on utilities. Like under the proposed action, the pumphouse could be damaged by construction to remove the existing wharf and replace it with riprap. Increased electrical demand would result from trail-side lighting along the top of the riprap.

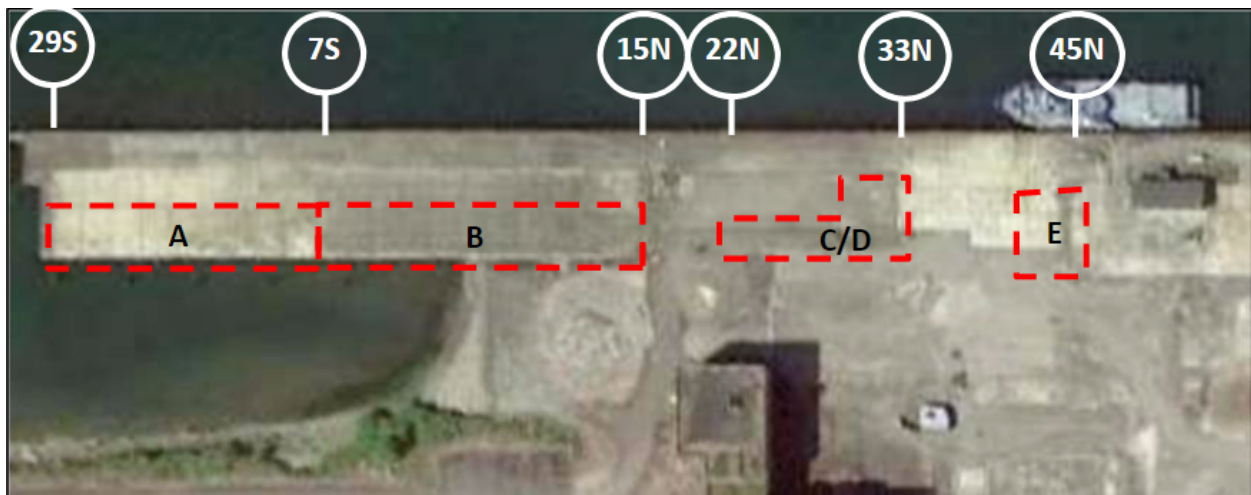
### **Mitigation**

As the impacts are less under this alternative action, so are the mitigations. Maintaining the pumphouse would ensure proper functioning of stormwater utilities. Utilizing renewable energy in the form of solar lighting alongside the trail would eliminate the dependence on electricity generated elsewhere, possibly by climate- and air quality-damaging fossil fuels.

### **Alternative: No Action**

#### **Impacts**

Under the no action alternative, there is a significant risk inherent in not updating the wharf. The pumphouse is vital to the functioning of downtown Bellingham's stormwater runoff management, and the wharf it is located on is currently unsafe in several sections (see Figure 19). Section E is located extremely close to the pumphouse, and if the pilings or surface fails, this could damage portions of the pumphouse, the electrical wiring powering the pumphouse, or the stormwater pipes leading to the pumphouse.



*Figure 19: Unstable portions of the GP Wharf (all sections outlined in red) (Moffat and Nichol, 2015).*

#### **Mitigation**

This report recommends that consistent maintenance be conducted on the pumphouse to ensure that the failing wharf does not result in damage to the pumphouse's function of removing stormwater runoff and disposing of it in the ASB. In their report on the structural integrity of the wharf, Moffat and Nichol recommend that Area E of the wharf, the section closest to the pumphouse (also referred to as part of Section 6) be inspected every two years (Moffat & Nichol, 2015). This report recommends that inspection also include the integrity of the pumphouse in relation to the structural integrity of Section 6, Area E, in order to maintain proper functioning of the pumphouse.

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## Appendix

### **Endangered Species Act Rules and Regulations (Including Critical Habitat)**

(This is a brief summary of the introduction to the Endangered Species Act of 1973).

Certain species of “fish, wildlife, and plants” are under special threat from human activity, and are now under federal protection to protect their habitat and survival. Human action to preserve their habitat and protect their populations is necessary, and this protection is carried out under law enforcement support. Scientists and agencies can petition the local government to list a species as endangered, and the regulatory agency has 90 days to review this proposal.

The whole legislature is available at:

<http://www.nmfs.noaa.gov/pr/pdfs/laws/esa.pdf>